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# HYPEROSTOSIS CRANII,

## WITH THE REPORTS OF FOUR NEW CASES; A FIFTH CASE CONTRIBUTED BY DR. MORTON PRINCE; AND PHOTOGRAPHS OF A SPECIMEN IN THE ARMY MEDICAL MUSEUM.

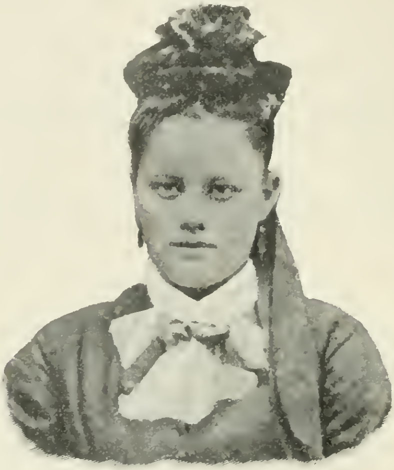
By James J. Putnam, M.D.,
OF BOSTON.

Nine years ago I had the opportunity of studying, at the Massachusetts General Hospital, a woman with an extraordinary enlargement of the head, associated with a partial obliteration of the cranial apertures, which had pushed out her eyes, paralyzed both facial nerves, and destroyed the hearing of both sides. The appearance that she presented was very unusual, and the photographs (Figs. 1, 2, and 3) give only an imperfect impression of the reality. The patient was at first in the wards of the hospital; later in the out-patient department. The diagnosis of hyperostosis cranii was made by Dr. R. H. Fitz.

I kept up my knowledge of this patient after she left the hospital, until, some years later, she drifted into Cambridge Almshouse, where she died. I then had the opportunity, through the kindness of Drs. Holt and Bryant, of being present at the post-mortem examination and of securing the specimen for the Warren Museum.

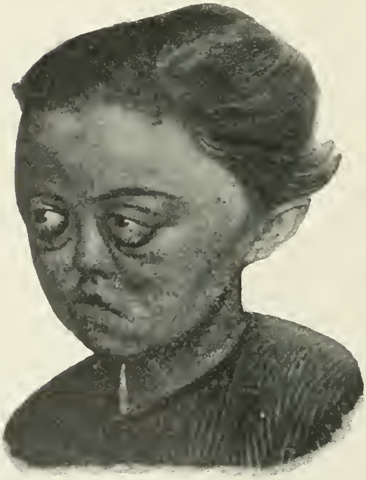
A brief outline of the case was given in the *Transactions of the American Neurological Association*, but the photographs which I obtained have never been published. Since then I have seen three other cases which seem to belong in the same category with hers, and Dr. M. A. Starr, of New York (December, 1894), has recently published in the American Journal of the Medical Sciences a case apparently of the same disease, but presenting special features of interest. Dr. Starr suggests for the disease the name of megalo-cephalie, using this term to indicate a possible analogy between the case described by him and cases of acromegaly. It is possible that Dr. Starr's case is of a different type from the others here referred to, but I shall provisionally assume that they all belong in the same category.

Fig. 1.



Taken before illness began.

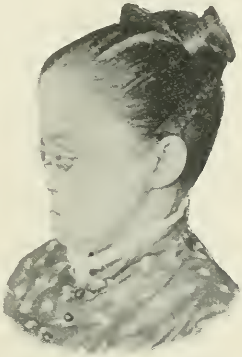
Fig. 2.



As when first seen at Massachusetts General Hospital.

The literature of this subject has not yet become extensive, though sufficiently so to call attention to certain points of considerable interest.

FIG. 3.



Taken at Cambridge Almshouse about a year before death.

The best account that I have been able to find of the enlargements or thickenings of the cranium that are of interest in this connection, in publications prior to 1892, is that given by Virchow in his *Krankhafte Geschwülste*, to which all later writers refer with great respect. The term leontiasis ossea was suggested by him, to call attention to a possible analogy with elephantiasis of the dermal tissues, as well as on account of the appearance of the face with its bony prominences.

In 1892 Dr. F. Baumgarten published in Paris a monograph entitled "Leontiasis Ossea" *(Hyperostose des Os de la Tête)*, in which he not only summarizes the earlier literature, but gives a description of thirteen famous skulls contained in one or another of the museums of Europe, and also analyzes the few clinical histories on record, with the result of bringing out a pathological theory of decided interest which is similar to that suggested by Dr. Starr in his excellent paper.

In the appendix a number of references are given which are taken from Baumgarten's monograph.

Le Dentu's paper is of especial interest, but deals rather with diseases of the jaws than of the skull.

Baumgarten also discusses the possible relation of the osteitis deformans, described by Sir James Paget, to the malady here in question. A distant relationship there may perhaps be, but Paget's disease affects the long bones more especially and is an affection of a later period of life.

In Virchow's opinion all the bony thickenings, whether localized in the form of osteophytes or generalized as in the specimens before us, are considered to be due to local processes of irritation or inflammation, and he points out how changes first localized and initiated by injury or disease of adjacent parts may spread so as to involve a large part or the whole of the head. Thus in one of the most celebrated cases (Forcade) a suppuration of the tear-passage in a young boy seemed—although in Baumgarten's opinion the sequence was really the reverse of this—to give the impulse to an outgrowth of immense bony masses covering eventually the whole of the face and associated with thickening of the bones of the cranium. In Dr. Prince's case, also, a local injury seems to have been the immediate cause of the disease. In another case a diffuse enlargement of the head seemed to have had its origin in an erysipelas of the scalp, and this association was considered to be of special importance from the fact that elephantiasis, which Virchow considers to be pathologically somewhat allied to this form of hyperostosis, sometimes has its origin in the inflammation of the skin.

In spite of the fact that Virchow emphasizes the local irritations as being the probable origin of all these tendencies to bony outgrowths, yet he hints at there being some more subtle influence at work, in pointing out that the enlargement of the bones in one part of the body is sometimes followed by that of other parts of the osseous system, and in noting that some persons have a "predisposition" to this form of disease.

It is of interest to note that Virchow's conception of "predisposition" possibly stands in a closer relation to the trophic theory to which I shall presently refer to than might at first sight be supposed, inasmuch as he includes under this category such influences as heredity and the tendencies attaching to particular epochs of development. He thus, in a measure, anticipates Baumgarten's observations that the disease in its typical form begins in early youth. In the majority of the published cases the bony overgrowth seems to have begun when the patients were but twelve to sixteen years old, and in one of my cases, as in one of those collected by Baumgarten, it seems to have first shown itself in infancy. In many instances, however, this rule does not apply.

It may well be, as has already been suggested, that in the celebrated case of Forcade, alluded to above, in which the process seemed to originate in the suppuration of a tear-passage, the inflammation was in reality the result, not the cause, of the bony growth. In fact, similar inflammatory reactions have repeatedly been noted, and the history of one of my patients affords a striking example of this sequence (Case I.).

Baumgarten was the first, so far as I know, to suggest the theory to which Dr. Starr's case brings support, that the overgrowth of the cranium is perhaps a trophic change, analogous to acromegaly.

Dr. Starr advances, in support of this view, the fact that in his case the enlargement of the cranium formed only one part of the morbid change. The neck had grown thicker and shorter, the features coarser, and the skin had taken on an appearance slightly suggestive of some such trophic change as occurs in myxœdema.

In the present state of our knowledge it does not seem to me that we have sufficient evidence for deciding either in favor of or against this theory, nor are our pathological conceptions of what constitutes trophic change as contrasted with a local disease by any means satisfactorily clear. Baumgarten observed that in one or two instances the sella Turcica was unusually large, or otherwise changed in shape, as suggesting disease of the pituitary body, such as has been found in acromegaly. But these observations stand too isolated to count for much as yet, and as a matter of fact, in my specimen, the sella Turcica was narrowed like the other cavities of the skull. In another of my cases (Case II.), in which the disease began in youth, and apparently spontaneously, a somewhat bull-necked condition was present, which may perhaps have been analogous to that observed by Dr. Starr. Another explanation of this change suggests itself, however, which for Dr. Starr's patient at least may very likely be the true one; namely, that the tendency to bony overgrowth had involved the vertebræ of the neck, as in others of the reported cases.

As regards the changes in the skin and other soft tissues, none were present in my cases except in that the skin had taken on a yellowish color in Cases I. and IV., and that perhaps the hair in Case III. had grown unusually coarse. Virchow also refers to alterations in the skin and muscles of the face in the case of Forcade, but it is more than doubtful if these were of a kind to bear out the trophic theory. They seem rather to have been degenerative changes secondary to the disorders of nutrition incidental on the overgrowth of the bony parts beneath. And to the same cause falling of the teeth in my first case was probably due.

As against the trophic theory is the fact, which for the present must count for the essential one, that the pathological change hitherto observed seems to be an inflammatory one, involving the periosteum, the bone, the dura mater, in varying degrees, and usually leading to an obliteration of the diploë. Sometimes the diploë is rarefied, to be sure; but oftener it is changed to an ivory-like tissue, such as is occasionally seen in syphilitic skulls. In acromegaly, on the contrary, the changes are, on the whole, rather of the nature of hypertrophy, and signs of periostitis are, to say the least, not prominent.

In this connection the interesting point alluded to by Baumgarten should be noted, that the apertures for the nerves and vessels, instead of being narrowed, are occasionally found actually wider than normal, as this looks somewhat more like a development-change than an inflammation.

My specimen seems, at first inspection, to substantiate this observation; but, in fact, I think there is no doubt that the increased size of some of the apertures was due to secondary erosion or atrophy, and possibly the same may have been true in the cases cited by Baumgarten.

The most important arguments in favor of the trophic or developmental theory are, perhaps, those drawn from the fact that the disease typically begins in youth, on which Baumgarten lays special stress, and that other bones of the skeleton, especially, perhaps, the vertebræ, sometimes take part in the tendency to overgrowth. In my second case, indeed, the disease had apparently begun by the time the patient was five years old. In Case I. the first signs were noted when the patient was nineteen, though the disease had doubtless begun before that. In the other cases the process apparently did not begin until adult life, though it is reasonable to feel a doubt as to the accuracy of the observations. Occasionally, such symptoms as epileptic attacks have been seen before the bones of the head had obviously enlarged (see Case II., and Baumgarten's photograph), and this fact should be remembered in making up statistics as to the age of the patient at the onset of the disease.

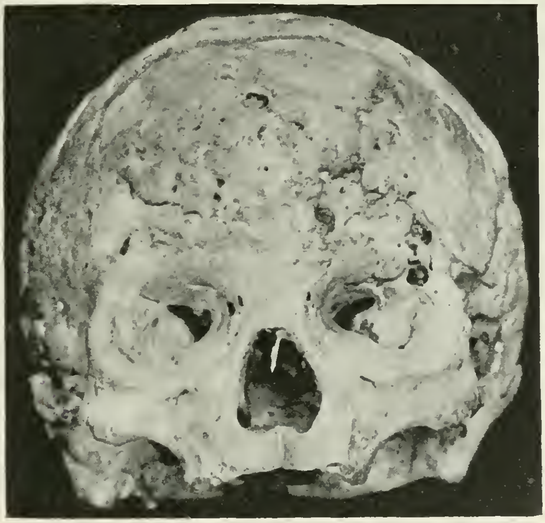
From the clinical side, this disease is of decided interest, and the number of clinical histories hitherto reported is so small (for many of the museum specimens were found accidentally post mortem), that new ones will, for a long while, be welcome.

The clinical picture of advanced cases is tolerably definite, though subject to considerable variation, depending on the rapidity of the growth of bone, its position with relation to the apertures and cavities of the skull, and whether or not it gives rise to exostoses projecting inward, and the position of these latter. There are, however, a few symptoms for which it is not easy to find an explanation. The reports of my cases will, perhaps, give a better idea of the symptomatology than a general description could do.

Case I. (Quoted in part from the records of the Massachusetts General Hospital, 1887.)—The patient was a Swedish woman, married, and twenty-eight years old when she presented herself at the hospital.

There was no sign or history of syphilis or other constitutional ailment, except that when she was three years old she had some disease of the ankle, followed by separation of several pieces of bone. The patient said that her mother and sister had both suffered greatly with their heads. It was not clear that they had actually had hyperostosis, though it was the patient's impression that their disease had been the same as hers. The patient thought that her own symptoms dated back to the time of her first confinement, nine years before. And her friends said that previous to that she was a good-looking, smart girl, *though inclined to excessive drowsiness.* One of the photographs (Fig. 1) was taken from an old ambrotype, and shows her condition at this period. She then began to suffer from headache and from pain in the ears and eyes, and this remained throughout a prominent symptom. Two years later she had a miscarriage, and a few years after that her teeth began to fall out, until, finally, they were all lost. A year or two after that she began to become deaf, and her hearing finally disappeared entirely. The pains in the head increased intermittently, to great intensity. They were felt mainly at the vertex and through the temples. The broadening of the head and prominence of the eyes attracted attention a little later than the first symptoms. At the time this record (1887) was made her friends thought her intelligence had not suffered. For the past five years her skin, which had previously been white and fair, had been getting dark and discolored, at times very yellow. There had been a sero-purulent discharge from the ears since the early part of the illness, and the catamenia had been absent for three years. She felt dizzy when walking, and her husband said that when she tried to rise after having been asleep she often fell in a heap on the floor. The sight was said to be poor in one eye. The motions of the hands was unaffected. The temperature at her entrance into the hospital was 99° F. A.M. and 99.8° F. P.M.; the pulse 100 and 110. Respiration 16, 24. The quantity of urine passed on three successive days was forty, forty, forty-seven ounces.

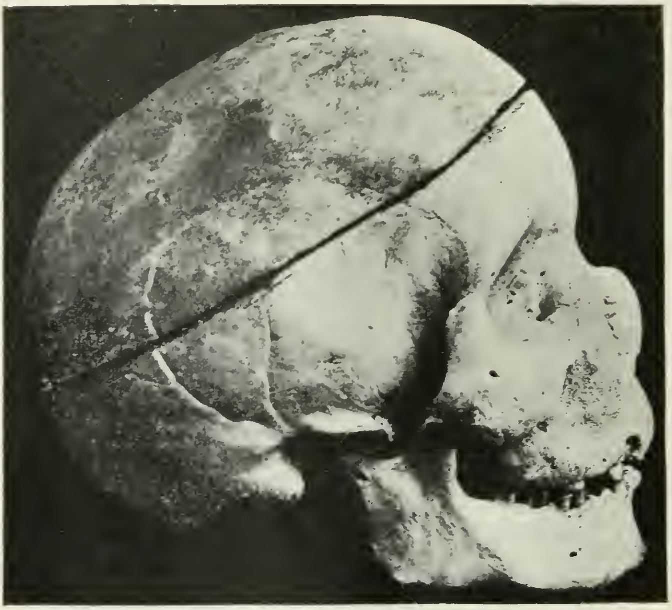
FIG. 4.



Her eyes, which were excessively prominent, were examined by Dr. O. F. Wadsworth, who made the following report: "R., media clear, fundus appears normal, though disk looks a little pale. L., a dense, sharply defined opacity occupies the anterior cortical portion of the lens, extending from the upper and inner border of the lens nearly to the centre. The patient is so uneasy and restless that no view of the fundus could be obtained. The iris reacts normally on both sides, and the movements of the globe are unaffected, except that there may be some diminution in the extent of the movement in all directions." In addition to these signs and symptoms, the patient had double complete facial paralysis, which contributed greatly to the drawn expression of the face, illustrated by the later photographs. At what period this came on I do not know, but it persisted throughout her life, and the examination showed that it had its origin in obliteration of the Fallopian canals. Her death occurred at the Cambridge Almshouse some years later than this, from prostration due to purulent periostitis cranii, and (secondary ?) amyloid disease of the kidneys and liver.

The notable features of the post-mortem examination were a generalized purulent periostitis cranii, which has destroyed portions of the bony prominences ; and an amyloid degeneration of some of the internal organs. The brain was to all appearances entirely healthy. I kept it for a long time, hoping to be able to study up the condition of the auditory and visual centres, but this has not been done.

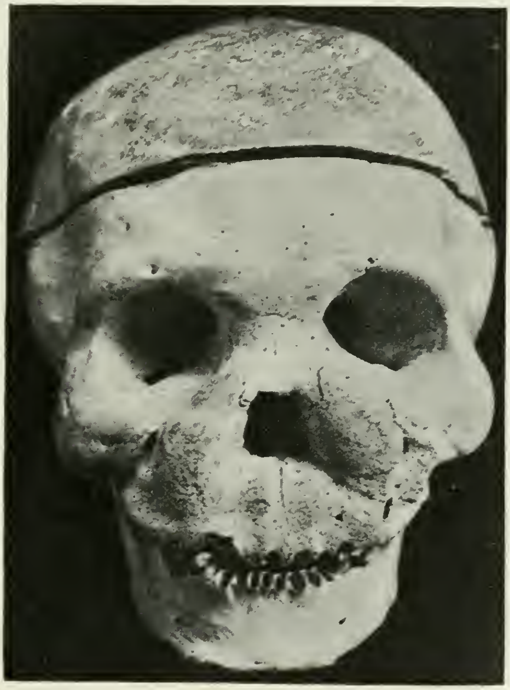
FIG. 5.



In external appearance the cranium (Figs. 4 and 5) is characterized (not to speak of the worm-eaten appearance due to caries, which will be described later) by a globular shape, a relative prominence of the forehead, broadening and flattening of the nasal processes, enlargement of the malar bones, and small size of the orbits, which are surrounded by relatively massive rims. The entire surface is uneven, but in general smooth and of a yellowish color. As a whole the specimen is relatively small, but broad, and when looked at in the front the leonine appearance given by the prominent forehead and cheek bones is well marked, though not so characteristic as in another remarkable specimen from the Army Medical Museum at Washington. (Figs. 6, 7, and 8.)

On closer inspection the surface of the frontal bones and the lower half of the temporals is seen to be worm-eaten from caries, due to the suppurative process to which allusion has been made. Either in consequence of this cause, or else as a result of simple atrophy, both zygomas have been nearly destroyed. One is almost wholly wanting, and the reduction in size of the other is the more striking from the relative massiveness of the malar bone from which it springs. Its surface, however, is for the most part smooth. The weight of the skull is nearly twice that of a normal specimen of the same size. On section the hyperostosis is seen to be universal, but the greatest thickening is anteriorly, where it reaches nine-sixteenths of an inch, or one and five-tenths of a centimetre. At certain points on the temporal bones the caries has given rise to perforations, and signs of the erosion are seen at various points within the skull.

FIG. 6.

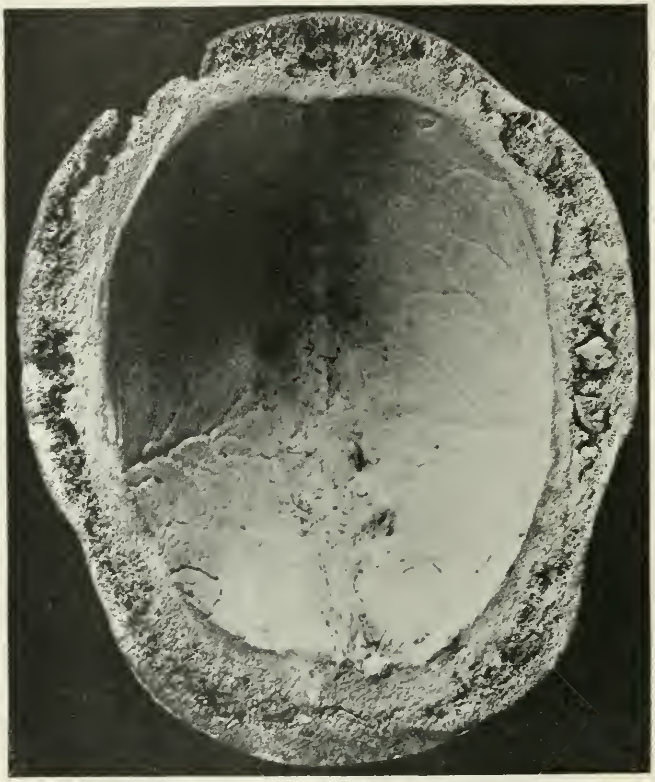


The capacity of the interior is, on the whole, not greatly diminished, but all the sharp lines and processes are thickened and rounded, and here and there, as on the floor of the anterior fossa and over the left petrous bone, distinct prominences are to be seen. The sella Turcica is also narrowed by a growth of bone, an important point in connection with the observations of Baumgarten.

The inner surface is somewhat rough and uneven, and scarcely a trace of sutures is to be seen. Indeed, the sutures are not visible, even upon the outside, except for short distances here and there, as irregular lines. The edges of the cranial apertures are thickened and rounded, except where the bone has suffered from caries or atrophy. The Fallopian canals are entirely obliterated; likewise the passages through the cribriform plate of the ethmoid.

It is noteworthy that the vascular grooves are practically absent, and in that respect the specimen contrasts greatly with the one next to be described, and with several of those noted in Baumgarten's collection. The diploë is converted into a dense, homogeneous, ivory-like growth of bone.

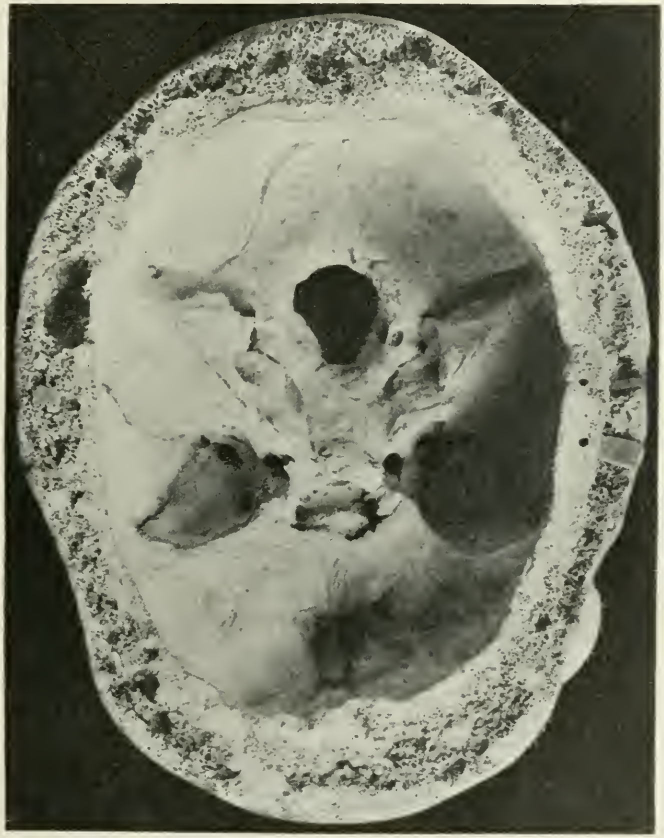
FIG. 7.



CASE II.—A young man, aged eighteen years, was referred to me in January, 1889, from the Massachusetts Eye and Ear Infirmary, where he had gone for advice on account of deafness. His ears had been examined by Dr. C. J. Blake, who reported that both middle ears were fairly normal, and the Eustachian tubes free. He had found, however, that the hearing was entirely absent on both sides for both aërial and bone conduction. In speaking, the patient showed a tendency to an imperfect production of the soft consonants.

I followed this case also from the time of his first coming to the hospital until his death, which occurred some three years later. His history, as given by himself and his friends, was the following: When he was five years old he fell from a stone wall and was unconscious for half an hour. Except for this he was perfectly well until seven years old. Then he began to have convulsions, but had only three in the first year and two in the next, and then none until he was thirteen years old, when he had a slight one in the night. After that none occurred until within about a year before his death. The later epileptic attacks were not localized. They were ushered in by a cry. For several years before coming to the hospital he had had dull headache, and his mental operations had become slow, so that when he sat down to write a letter he would have to pause and think for a long time before being able to proceed. At times he would get irritable and excited without apparent cause, a tendency which increased markedly toward the end of his life. His brother, who had not seen him for some time, said that his mental faculties were not so alert as formerly, and that he seemed to be changed in an indefinable way. On physical examination the head was found to be large and the forehead rounded and prominent. The marked broadening over the ears described in the

FIG. 8.



account of the other cases was not noted, but, instead of that, several broad, rounded prominences of which my notes contain the following description: "On the top of the head there are two broad exostoses, about two and a half inches across at the base and a quarter of an inch in height. One of them is situated to the left of the median line, with its posterior edge reaching to the line of the bregma; the other is on the right of the median line and its anterior edge is about an inch and a half behind the posterior edge of the other growth. Besides this the occipital protuberance is very prominent and the temporal ridge unusually full. The forehead is rounded with a large curve, and along the frontal bone there is a narrow groove which begins almost at the root of the nose, runs upward, curving slightly to the left, and ends at the edge of the hair. A similar groove, but less marked, exists on the right side, and the two enclose an ellipse, through the middle of which runs the frontal suture. Similar grooves are found in other parts of the head, following the course of the sutures, though not exactly in the line of them. The eyes have a prominent and staring look, and his friends think they have gradually become worse in these respects. The pupils respond to strong light, the right better than the left." A slight but well-marked optic neuritis was noted at this time, that of the right eye being somewhat greater than that of the left. The neck looked very full, but the patient said his collar felt no tighter than formerly. The pulse at the end of a long examination was 130, but when taken by his physician at home it was found to be 62 in the morning and 75 at night. With regard to the possibility that the exostoses originated in the fall from the wall above alluded to, it is noteworthy that his brother says that the head was shaved within three hours after the fall occurred, and the lumps were found to be already present, though no larger than a bean.

The subsequent history of this case was in brief one of very slow, progressive mental deterioration, varied by intervals of excitability and occasional epileptic seizures. The exostoses and the head in general became steadily larger and larger. He continued to work as a roofer for some years after his deafness had become complete and after the neuritis had begun. But finally the eyesight failed more and more, and the gait became so feeble and uncertain that he remained practically confined to his room. I did not know of his death until some time after it occurred. His friends then told me they would have been glad to have had an examination, but that the physician in the town where he lived unintelligently discouraged the idea.

CASE III. is that of a man referred to me by Dr. H. O. Marcy in December, 1892. He was then fifty years old, married, and engaged in the provision business. His health previous to the present illness had always been satisfactory. He gave the history that his head had been growing larger for ten or twelve years. Neuralgic pain recurring at short intervals in various parts of the head had bothered him for some years, and for the past year had been especially troublesome. At times this pain had been attended with nausea and vomiting. At first it used to be felt mainly in the temples; later, in other regions as well. His eyesight was good, but the hearing had been poor for a number of years. He found it especially hard to catch what was said when a number of persons were talking, and this difficulty was increased by a throbbing sensation in the right ear, which could be temporarily relieved by pressing on the bloodvessels of the neck.

He felt well in most respects, but was troubled by bad dreams, and when the headache annoyed him he felt drowsy, unless the pain was very severe, when he could not sleep. His feet felt cold and his head hot. At times he had a sense of light-headedness, and his legs would seem to give out. He could assign no cause for his disease, with the exception that fifteen years before he had abscesses in both ears; whether in the middle ear or the meatus he could not say. This history, of course, throws doubt on the supposition that the deafness was due to pressure, although, as in the Forcade case, and in my case No. 1, the suppuration may have been a sign of disordered nutrition. As regards the evidence as to the size of the head, the patient reported that whereas he used to wear a $6\frac{7}{8}$ hat he now wears a $7\frac{3}{4}$, and that his measurements were constantly increasing. (Figs. 9, 10, and 11.)

FIG. 9.

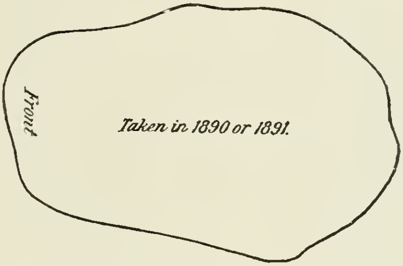


FIG. 10.

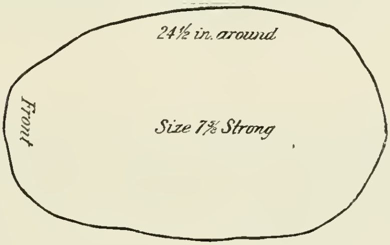
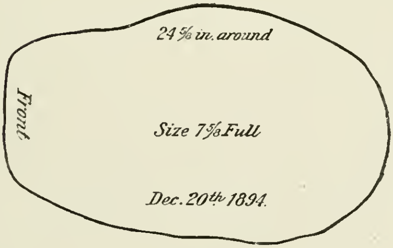


FIG. 11.



Neither in this case nor in either of the others, unless possibly the first, had any other member of the family suffered in a similar manner as the patient. The following letter gives an idea of his present condition :

February 9, 1895.

Dear Sir : Yours of January 12th received in California. In reply to your kind inquiry will say that my head is still growing slowly about one-quarter of an inch a year. I do not have any more trouble with it than usual, but think that throbbing, every time my heart beats, up through my ears, mostly my right ear, is increasing, which is quite disagreeable. It makes me hard of hearing, and sometimes it keeps me awake nights. I have to place my finger on the side of my neck over a vein when I want to hear anyone speaking. I have been troubled with it for twelve or fourteen years, ever since my head commenced to grow larger.

On physical examination the patient is seen to be a man of middle height, and rather slender in general build, which makes the great size of the cranium the more striking.

The enlargement affects especially the frontal and lateral portions, but is diffuse, though accentuated here and there in such a way as to cover the surface with irregularities and prominences of varying size.

The bones of the face are not enlarged, but the edges of the orbits are thickened and the upper lids somewhat prominent, as seen in cases of Graves's disease.

Every exertion and every posture that interferes with the return of venous blood from the head brings on at once a strongly marked congestion of the face, with sweating, and causes the veins of the forehead to stand out very prominently. He has found the throbbing relieved by wearing round the neck a light steel spring with a pad to compress the carotid. The propriety of a permanent closure of the vessel by ligature is being considered by his physician, Dr. H. O. Marcy.

Case IV.—Female patient, a dressmaker, aged thirty-five years. The enlargement of the head was first noticed twelve years ago or more in the neighborhood of the left parietal eminence, but the exostoses, which will be described, were not observed until later. The only symptom of note has been a tendency to attacks of a quite severe burning sensation referred to the right side of the head and face, and associated with a sense of numbness in the face. These attacks last five minutes or less. Sometimes, in connection with them, the jaw gets stiff, apparently by contraction of the muscles of mastication on the right side. If, while lying in bed, she stretches herself with the hands over the head, an intense and painful feeling of fulness comes on, evidently an exaggeration of a sensation that we have all experienced, but so severe as to oblige her to compress the head with both hands for relief. Sometimes she seems to have a sort of double vision, which is perhaps due to an irregular action of the ocular muscles. On physical examination the head is found to be greatly enlarged in all directions, though not uniformly. The greatest width is above the ears, where the cranium broadens rapidly. The longest circumference is sixty-five and a half. centimetres. The surface is very irregular, and covered with bony prominences of different shapes. The bone in the neighborhood of the temporal ridge is enormously thickened, while above that on either side there is a shallow depression stretching along parallel with the median line. The veins on the temples are distended. The eyes do

FIG. 12.

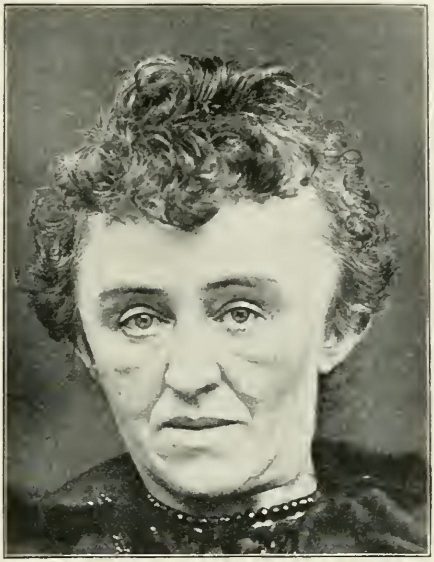
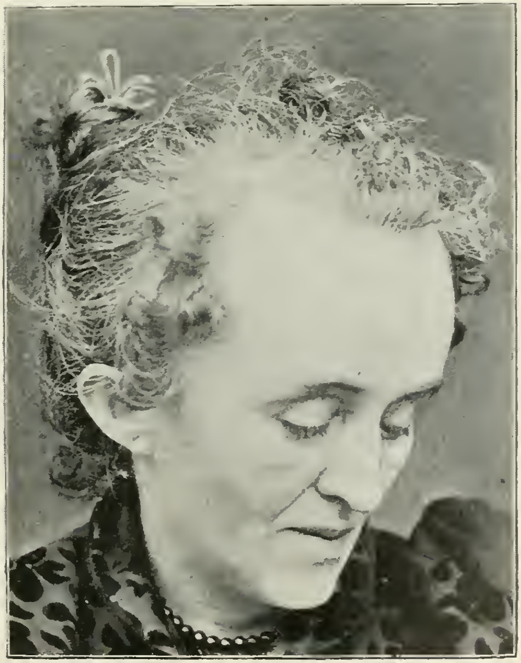


FIG. 13.



not protrude, but the upper edge of the orbit is thickened and rounded so as to form a prominence below the eyebrows. The nutrition of the teeth has not been interfered with, but they were extracted on the right side in the hope that this might relieve the pain. The eyes were examined by an oculist in Manchester, and found normal, with the exception of astigmatism and presbyopia. There are no trophic changes in the skin, face, neck, or limbs, but the patient has a heavy crop of rather coarse hair.

The photographs give no adequate notion of the enormous dome which her head presents, but the massive forehead and the great length of the measurement from the ears to the vertex are quite evident. (Figs. 12 and 13.) The thickening of the orbital plates is sufficiently clear.

For the sake of convenience of reference, and in order to show the variability of the symptoms in the different cases, I have arranged in the order of their frequency the symptoms presented by the seven more typical cases collected by Baumgarten, together with those which occurred in Dr. Starr's and Dr. Prince's cases and in the five others here recorded.

Baumgarten divides the deformities of the skull into three types, according to whether the vault of the cranium, the upper face, or the lower jaw is the part primarily and mainly affected. The greater number of cases fall within the second of these groups, and even where there is no marked deformity of the face still the changes found post mortem may predominate in the anterior portion of the cranium, as in my first case, and in that of a patient whose history has been given me by Dr. Morton Prince.

The ages of the patients at the assumed onset of the disease were as follows:

| | |
|---|---|
| Under 5 years | 2 cases. |
| 5 to 10 " | 1 case. |
| 10 to 20 " | 4 cases. |
| 20 to 30 " | 1 case. |
| 30 to 40 " | 3 cases. |
| Over 40 " | 3 cases. |

In other words, seven patients were under twenty years of age at the onset of the disease, and seven were apparently over twenty years of age. The patient whose skull is preserved in the Warren Museum is said to have been well up to the age of fifty.

Certain symptoms or signs are worthy of note as having occurred before the bony change was noted:

Epileptic attacks occurred very early in two cases; suppuration of the ears in two cases; of the tear-duct in one case; erysipelas of the head in one case.[1] An injury of the head seems to have been the cause of the disease in Dr. Prince's case

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[1] See also the report of a case by Edes, in this number of the JOURNAL.

As a matter of fact, it is not improbable that some of these events were due, directly or indirectly, to the disease in the bone. In one case (Observation 3, Baumgarten's collection) deafness and blindness occurred quite early, and were apparently related to a family tendency.

Of the symptoms due to the bony changes the most common is headache, which was present in about half the cases. This may be diffused or localized, but is probably due, as a rule, rather to a disease of the bone itself (osteocopic pain), than to intracranial pressure. This is also Baumgarten's view, and it is borne out by the fact that the pain may be present without other symptoms of pressure. Sometimes such symptoms do exist, however, as double optic neuritis in my second case and optic atrophy in Dr. Prince's case. Another cause for the headache is then present, and the whole symptom-complex might easily suggest tumor or some other sort, especially if, as happened in one case, the bony changes were not marked externally.

Pain is sometimes also felt in the face and in the limbs.

The next most common symptom is mental irritability or enfeeblement, which was noted in seven of the cases. Exophthalmos was present in four or five of the cases, but sometimes where this cannot be distinctly made out the edges of the orbits may be felt to be thickened or the upper eyelids to be unnaturally prominent, as in some cases of Graves's disease. Loss of hearing was noted in four of the cases, and loss of smell and taste in three; but it is highly probable that careful examination would have found this sign oftener. Insecurity in walking was very marked in three cases, and in my second case it led eventually to a high degree of helplessness. Awkardness in the use of the hands was noted in two of the cases. Occasionally epileptic attacks come on as a late symptom.

In my first case the teeth were all lost quite early, and this is of special interest because Baumgarten declares, in discussing the differential diagnosis between hyperostosis and sarcoma, that the teeth have no tendency to fall out in hyperostosis, but are often lost in sarcomatous disease of the jaw.

Double optic neuritis is not noted in any case, except No. 2 of my collection,[1] but it had probably been present in Dr. Prince's case, as atrophy was found at the time of his examination. Drowsiness was quite prominent in two of my cases, also in that reported by Dr. Prince.

The course of the disease is always a very long one, and the prognosis is unfavorable. The clinical history of my first two cases shows some of the modes in which the fatal result may be brought about.

Besides the cases to which I have hitherto referred, the Warren Museum of the Harvard Medical School contains a very interesting specimen originally belonging to the Spurzheim collection. It is described in the catalogue as follows:

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[1] It was present in Edes's case.

"No. 1209. Top and base of a remarkably thick skull of a woman, who, at the age of fifty years, enjoyed the use of all her faculties. From this period her skull thickened gradually by disease, and her faculties became impaired in the same ratio, until she died at the age of sixty years. The average thickness of her skull is about one inch, and the extremes three-eighths to one and one-half inches."

In spite of the excessive thickness of this skull, it is remarkable that the bones of the face are relatively little affected. Taken as a whole, the great width of the ears, amounting to eight and three-eighths inches, is one of the most striking features.

The average thickness is about one inch, the extremes being three-eighths and one and one-half inches. The outer surface is generally smooth and polished, and there is hardly a trace of sutures to be seen.

On the inside the bone is excessively irregular and the cavity evidently encroached upon, in spite of which the edges of the sphenoid and petrous bones have preserved their delicacy, and the canals and apertures have not been much narrowed. The grooves for the vascular canals are deep and numerous. The diploë is, for the most part, destroyed, though sometimes present.

In addition to the plates of this specimen, I am permitted, through the kindness of the Curator of the Army Medical Museum of Washington, Dr. Walter Reed, U. S. A., to reproduce some very beautiful photographs which finely illustrate the leonine type of this disease. Dr. Reed writes that no history of this case is preserved, except that the specimen came from a mulatto woman, and was found in a dissecting-room in Baltimore.

Finally, I have the opportunity, through the kindness of Dr. Morton Prince, of reporting a case which he had personally observed, together with the report of the post-mortem findings:

The patient was first seen in consultation by Dr. Prince, two years before his death, in the wards of the Boston City Hospital. It was then stated that four years previously he had been struck on the forehead by a pulley, which made a wound three inches long. It was uncertain whether or not the bone had been broken.

Two years after this he first noticed swelling of the frontal bone. He thought his eyesight began gradually to fail about this time; but said that his eyes had always been prominent(?). He had suffered throughout his illness with constant dull pain in the forehead, and nausea and vomiting had been of frequent occurrence. While in the hospital his chief symptoms were frontal headache, great drowsiness, and mental dulness. His memory had evidently become impaired.

Both eyes were very prominent, and an ophthalmoscopic examination by Dr. H. W. Williams showed partial atrophy of the right optic nerve and a number of small retinal hemorrhages. There were no marked paralytic symptoms, and no other cause for the disease could be assigned than that given above. Syphilis was denied. At an interview subsequently to this the patient's wife stated that the mental condition had been dull and peculiar for a long period. His memory for recent events had become very poor. It was also difficult to make him understand new ideas, though he could converse on various topics, especially on those related to his army life. He was emotional and at times sub-delirious. Although his eyesight had become much impaired, he could see enough to read till shortly before his death. His wife further stated that for several months previous to his entrance into the hospital he had a hemiparesis of the left side without aphasia.

At the post-mortem examination the frontal bone was found thickened in the mid-frontal region so as to form a prominence an inch thick, over an area three and a half inches wide by two inches high. The temporal ridge, at its frontal end, was also thickened and prominent, so as to form a sort of exostosis.

On removing the calvarium it was found that the under surface of the bone in the frontal region was quite firmly adherent to the dura. The bony prominence of the forehead did not project much on the inner surface of the skull, but this surface of the frontal bone was thickened evenly and had a smooth, shiny appearance. It looked as if the bone had become thickened by even deposits of extra layers of bone.

The orbital plates within the cranium were enormously thickened and enlarged, so that they compressed the brain upward. The under surface of the superior orbital plates could be plainly felt in the orbit with the finger. Owing to the thickening of the bone this surface formed a plane nearly on a level with the superior margin of the orbit, so that the natural convexity seemed to be almost lost, and the orbital cavity diminished in size. This diminution of the cavity had pressed the eyes outward during life.

Within the cranium the orbital plates measured one and one-half inches antero-posteriorly. The space between the orbital plates measured on an average three-quarters of an inch in width. Into this space the corresponding convolutions of both hemispheres had been squeezed. The frontal bone beyond the limits of the exostosis was one-half of an inch thick. (This last measurement was apparently at level of the section, but the height at which the section was made is not given in the notes. It could not have been through the exostosis.) The convolutions of the frontal lobes were plainly compressed between the orbital plates below and the frontal bone above. The convolutions measured on an average one-quarter of an inch in diameter in the frontal lobes, and from three-eighths to one-half of an inch in the middle lobes. Further examination (macroscopical) of the brain revealed nothing remarkable excepting a large quantity of fluid in the ventricles.

Dr. Prince adds in conclusion: "I would say that the condition of the skull and brain at the autopsy gave the impression that if a considerable portion of the frontal bone had been removed by an operation during life his condition might have been relieved. This operation had been considered, but was given up."

The likeness of some of the symptoms to those of brain-tumor in many of these cases is indeed obvious, and the question naturally presents whether operative interference could be of benefit. One of my patients entered the Massachusetts General Hospital to have this question considered in his case, but it was decided, perhaps without sufficient reason, that the operation should not be done, in view of the fact that the change was of so diffuse a character that hearing was already lost and eyesight impaired, and that it would be impossible to form much idea as to the exact position of the intracranial exostoses, the presence of which was assumed. Virchow says that these are apt to coincide more or less with external prominences, where such exist, but this is by no means always the case. The great thickness of the bone would render operation difficult and long, but I think it should be tried when the growths are moderately circumscribed. It is worth considering whether it might not be possible in some way to arrest or retard the progress of the disease, and it has occurred to me as conceivable that the bone might be starved out by cutting off its supply of blood. No other treatment hitherto suggested has been of service, although in one of my cases I tried the effect of giving thyroid preparations, as did also Starr in his.

[Since this paper was written I have had an opportunity, through the courtesy of Dr. R. T. Edes, of seeing a typical case that was under his care, a description of which appears in this issue of the JOURNAL.

I would call attention to the fact that this makes the second case in which chronic optic neuritis has been found, and also confirms my impression that the anterior portion of the skull seems the part most likely to be affected. The case is also important in other respects. The patient had an attack of erysipelas of the head or face in early youth, as noted by Virchow in one or more of the earlier cases. It was noteworthy, furthermore, that the thickening did not involve the bones of the orbit, to any extent, if at all. The upper border, instead of being heavy and rounded, was as sharp as in health. Above this the frontal bone was at its proper level, and apparently unchanged for a few lines, but immediately beyond this the shelving forward began.

I have not attempted in the preceding paper to give any account of so-called osteitis deformans of Paget, because, although the bones of the head are sometimes involved in that affection, its characteristic feature is the change in the long bones; while, on the other hand, this does not form a characteristic element in the cases such as I have described.

I will, however, refer to the fact that very recently the account of an autopsy in Paget's disease has been published by Gilles de la Tourette and Marinesco (*Nouvelle Iconographie de la Salpêtrière*, July and August, 1895), according to which the posterior columns of the spinal cord were found degenerated. It seems to me probable that this change was not the cause of the nutritive disorders of the bones, but an associated condition, since, as everyone who has followed the literature of the spinal-cord diseases is aware, nutritional and debilitating affections of various sorts leave their stamp on the nervous system in that form. The authors cited, however, do not wholly share this view, and their reputation entitles their opinion to much weight. Although they do not speak positively, they are inclined to consider that these changes point to a spinal cause of the bony changes, which makes them analogous to those met with in tabes. They refer also to an earlier post-mortem made by Tourette and Magdelaine, where a similar lesion was found in the cervical region of the cord, the rest not having been examined. It is noteworthy that the columns of Clarke appeared not to have been involved. The nerve-trunks of the lower extremities were enlarged and œdematous, and were the seat of an interstitial neuritis which they consider to have been of vascular origin.]

## APPENDIX.

1. *Baumgarten:* Léontiasis Ossea.
2. *Huschke:* [Ueber Craniosclerosis Totalis Rachitica. Jena, 1858].
3. *Jadelot:* 1799.
4. *Gaddi:* [Iperostosi Scroful. Cerebr-vertebral. Modéne, 1864].
5. *Le Dentu:* Rev. mens. de méd. et de chirurgie, 1879.
6. *Guyon and Monod:* [Hypertrophie diffuse. Dictionnaire Encyclopédique].
7. *Poisson* [*de Nantes*]*:* Semaine méd., 1890.

Poisson suggests the hypothesis of a trophic neurosis. Nine specimens without clinical history are described in connection with the specimen of Jadelot. It is said that the auditory canal is only slightly narrowed, and this is thought to be because the bone is simply an ossified membrane. Thirteen clinical observations are described, of which one (Saucerotte) is supposed to be a case of acromegaly, and four are cases of sarcoma or bony growths of the maxillary bones alone. Heath (on Diseases of the Jaw, p. 134) (Obs. 8) describes a case of unilateral hyperostosis of the face with hypertrophy of the soft parts and curious anomalies of dentition, the whole being practically congenital in origin. In one or two other cases the clinical history suggests that the disease may not have been typical of the affection here at stake.

The seven observations utilized in this paper are as follows:

OBSERVATION 1. *Ribel fils:* Thèse, Paris, 1823. Dissertation sur les exostoses.

OBSERVATION 2. *Saucerotte:* Mélange de Chirurgie, p. 407.

OBSERVATION 3. *Von der Sneck:* Ilg. Einige Anatom. Beob. Prague, 1822. *Gruber Wenzel:* Beitrag zur Anat. Phys., etc. Prague, 1847.

OBSERVATION 4. *Wrany:* Jahresbericht über die Leistungen, etc., 1867.

OBSERVATION 5. *Schützemberger:* Gaz. Méd. Strasbourg, 1856, No. 4.

OBSERVATION 6. *Biekersteth de Liverpool:* Trans. of Pathological Society of London, 1866.

OBSERVATION 7. *Poisson de Nantes:* Semaine Méd., 1890.

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# A CASE OF HYPEROSTOSIS OF THE CRANIUM.

BY ROBERT T. EDES, M.D.,
OF JAMAICA PLAIN, MASS.

Mrs. — has had eight children and two miscarriages. She ceased to menstruate at the age of forty-five, being now fifty-two. Her family history is not significant. Five (or six) years ago she had la grippe, which was succeeded by a light attack of facial erysipelas upon the left side. It is impossible to obtain from the patient or her relatives any very definite account of the time when the present condition of things was first noticed. She says that her head was always large, and she thinks it was always one-sided, but it is evident from photographs that it was not of its present shape. Within the last two years, however, it seems to have attracted the attention of some relatives who were not in the habit of seeing her frequently. Her daughter thinks there was some change as much as five years ago. A sister was very sure there had been no change in the shape of her head, and was convinced to the contrary only by seeing the contrasted photographs. At about the menopause she thinks she began to feel badly.

A weakness of gait has been noticed about four years. Recently she has been growing weaker, and complained of dull pains about the neck and shoulders and uncomfortable sensations about the head, but she is not subject to well-marked severe headaches. She now walks with much assistance, bent over and supporting a large part of her weight upon the nurse. The motion of the feet, however, appears unimpaired, as well as that of the hands, and there is no paralysis of any cranial motor nerve, unless possibly such is indicated by a barely perceptible droop of the left upper eyelid.

The knee-jerk is unusually strong upon both sides, but there is no ankle-clonus. The arm-jerks are also much beyond the average.

There is no enlargement of the bones of the extremities, the most characteristic feature in her general appearance, except the head, being the limp way in which she drops together, as if from relaxation of the osteo-ligamentous structure of the spine or weakness of the erector spinæ muscles.

Vision seemed all right until about six months ago. She passes much of her time in reading, holding her book about a foot away, and she has not been aware of any difference in the two eyes, although with the right she can barely count fingers three feet off. In the right eye the choroidal vessels are very prominent. The disk has a dark ring of pigment about it, but the edges otherwise somewhat indistinct, the vessels, however, being normal, and the color nearly or quite so. There is no protrusion. In the left eye the choroidal changes are perhaps more marked, and the outlines of the disk less distinguishable. Possibly slight optic neuritis or its remains.

The hearing is good.

The impulse of the heart is felt well out on the left in the fourth intercostal space, quite distinct, but not strong and heaving, giving the impression of an active but not powerful beat, corresponding to the ample but rapidly falling sphygmogram.

The general nutrition is in fair condition.

The urine is nearly normal, containing no casts and only a faint trace of albumin on one occasion, with a due proportion of urea and of indican.

Her mental attitude is not altogether unlike the bodily, and is in striking contrast to that of the ordinary neurasthenic. Her memory has been somewhat poor for a year. The mind is apparently perfectly clear, but its action is slow, vague and unexcitable. So far as one can judge from her manner, she takes only a slow and distant interest in her own case. Her reaction-times, between the movement of a shutter and striking a telegraph-key, averaged forty-one one-hundredths of a second, more than double the normal, and with a wide range of variation between the individual trials. Her speech, however, is not especially slow, indistinct, or slurred.

The form of the cranium is, of course, the most interesting feature of the case, and is highly characteristic. Figs. 1 and 2 show the change which has taken place at some time between early life and the present,

Fig. 1.

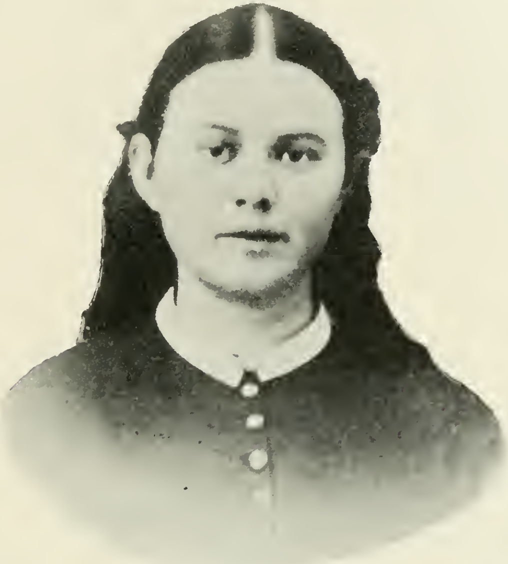
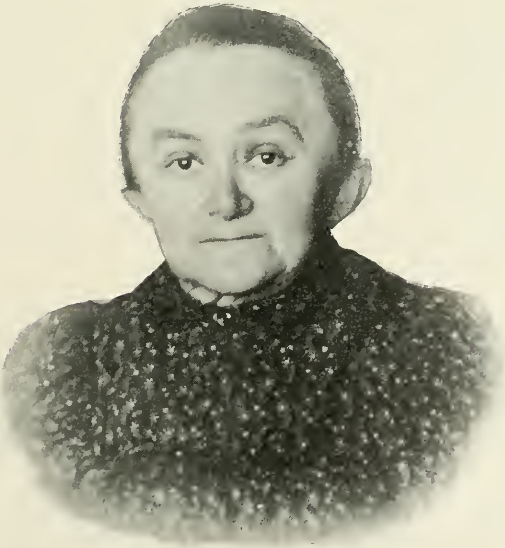
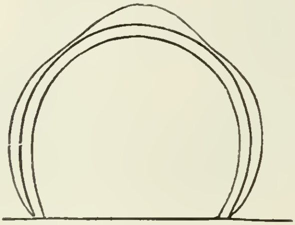


Fig. 2.



and presumably within a few years. The enlargement is especially noticeable in the anterior portion, the forehead being rounded, the temporal fossæ greatly filled out and rounded, giving the whole front view a bulbous overhanging look like that of hydrocephalus. The eyes are somewhat prominent. An outline from one meatus auditorius to the other in the neighborhood of the coronal suture shows three quite distinct enlargements, viz., in each temple and on the vertex, the next inner line giving the outline of a more average head. The third and inmost outline was taken from her daughter's head. (Fig. 3.) There is no tenderness anywhere over the head. The changes in the occipital region or cervical spine, if any, are not obvious to palpation. The hair is moderately thick and but very slightly gray.

FIG. 3.



Further comments are unnecessary in the presence of the very complete paper in this number of the JOURNAL by Dr. J. J. Putnam, who kindly saw this case with me after his article was already in the hands of the printer.

In the absence of any more definite indications for treatment other than general hygiene, I have felt justified in acting upon the hint given by certain remote resemblances of this rare and mysterious affection to myxœdema, and have begun the administration of dried thyroid in capsules. I have been informed, however, by Dr. Putnam, that this has been tried both by himself and Dr. Starr without favorable results, and further experience gives no reason to suppose that this case differs from theirs in that respect.

# THE ARGYLL-ROBERTSON PUPIL, ITS NATURE AND SIGNIFICANCE; A CLINICAL STUDY.

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CONSTRICTOR impulses for the pupil reach it by way of the third nerve, coming from its nucleus in the gray matter of the floor of the Sylvian aqueduct under the anterior corpora quadrigemina. From the third nerve they pass to the lenticular ganglion by its short or motor root; then from the ganglion by the myotic or short ciliary nerves to the iris (sphincter pupillæ). The afferent portion of the reflex mechanism concerned in the contraction of the pupil will be considered presently.

The centre for dilatation of the pupil is in the floor of the aqueduct of Sylvius, externally to the constrictor centre. Dilator impulses pass down through the crus cerebri, medulla oblongata, and spinal cord to the upper dorsal region; thence out by the upper dorsal anterior roots (particularly the second, third, and fourth, according to Budge) and rami communicantes to reach the ganglion stellatum (first thoracic sympathetic ganglion); then by the ansa Vieussens (which encircles the subclavian artery) and the cervical sympathetic to the superior cervical ganglion, where the fibres become non-medullated. They next pass, by the ascending (carotid) branch of the ganglion, to the Gasserian ganglion on the fifth nerve; then by the ophthalmic division of this nerve, and the nasal branch of this division, directly to the eyeball (mydriatic or long ciliary nerves to the dilator pupillæ).

A supposed "inferior cilio-spinal centre" was located by Budge in the lower cervical and upper dorsal region of the cord.

The probability that the dilator fibres for the pupil lose their medullary sheaths in the upper cervical sympathetic ganglion is in accordance with a general law expounded by Gaskell,[1] who has shown, with regard to vascular and visceral nerves, that while nerves whose function is of a katabolic order, including motor, constrictor, or augmentor nerves, nerves to circular muscles, and, in general, nerves conveying impulses which lead to a discharge of energy, lose their medullary sheaths in proximal (lateral or vertebral) ganglia of the sympathetic or visceral system; those, on the other hand, whose function is of an anabolic order, including inhibitory, retarding, or dilator nerves, nerves to longitudinal muscles, and, in general, nerves conveying impulses which lead to a storage of energy, become non-medullated in distal (collateral or prevertebral) ganglia.

In opposition to the view long generally held, a considerable body of evidence has lately been brought forward to show that there is no true dilator muscle in the iris, and that dilatation is, to a certain extent at least, produced by inhibition of constrictor impulses.

Gaskell has shown that the superior cervical ganglion of the sympathetic, which is connected with the central nervous system by the cervical sympathetic cord (cervical splanchnic) only, belongs to the group of collateral or distal ganglia of the visceral nerves. There is a striking analogy between the dilator nerves of the pupil and the inhibitory nerves of the circular muscle of the intestine. They both leave the cord in the thoracic outflow (upper and lower dorsal regions, respectively) as fine medullated fibres of the anterior roots; pass over the lateral ganglia (great sympathetic chain) and along the splanchnics (cervical and abdominal splanchnics, respectively) to reach the distal ganglia (superior cervical ganglion and semilunar ganglion, respectively) before losing their medullary sheaths. The distribution and course, therefore, of its controlling nerves suggest strongly that dilatation of the pupil is an inhibitory process.

Moreover, according to Fuchs, the posterior limiting membrane of the iris is its only structure that is not thrown into folds when the pupil dilates, so that probably the elasticity of this membrane has a good deal to do with dilatation. At the same time, it must be admitted that there is still some obscurity on this point, because a pupil which is dilated from paralysis of the third nerve can be still further dilated by the agency of atropine. It will be wise, therefore, not to lose sight of the older theory that a dilator pupillæ exists until we get a more satisfactory substitute.

The mode of production of the Argyll-Robertson symptom (reflex iridoplegia) introduces us to one of the most perplexing questions in the anatomy of the central nervous system. Not many years ago the question was answered very simply thus: The patient's vision is normal; therefore the lesion is not in the optic nerve or afferent part of the reflex arc. The contraction of the pupil during accommodation or convergence shows that the third nerve or afferent part of the arc is normal. And, therefore, it was inferred, the lesion must be in some fibres connecting the optic tract, or its termination in the primary optic centre, with the nucleus of the third nerve. As a matter of fact, Meynert has shown that fibres do run between the corpora quadrigemina and the third nucleus, so that these may be the seat of lesion.

But Gudden has demonstrated that the optic nerve contains special fibres for the pupillary light-reflex, distinct from those for vision, and accordingly the fact that vision is intact can no longer be accepted as proof that the optic tract and nerve are healthy. Moreover, Bechterew believes that the afferent fibres for the light-reflex pass the chiasma, without decussating, to the gray matter of the third ventricle, and thence to the nucleus of the third nerve on the same side. Mendel, and to a certain extent Darkschewitsch, believe that the centripetal route is by the optic nerve and tract of the same side to the ganglion habenulæ, then across by the posterior commissure to the opposite third nucleus.[2]

Darkschewitsch again describes a bundle which atrophies after extirpation of one eyeball. It leaves the optic tract on the side opposite to that on which the operation was performed, near the lateral geniculate body, passes through the thalamus to the pedunculus conarii and pineal body, and thence, passing by the ventral portion of the posterior commissure, reaches the oculomotor nucleus on the side of operation. This is another route which has been supposed to be concerned in the pupillary reflex.[3]

Morbid anatomy has not yet demonstrated the anatomical basis of the Argyll-Robertson pupil. We must, therefore, be content in the meantime with speculation.

It seems to me that additional light may be thrown on this symptom by a consideration of its associations. It is generally seen in cases of locomotor ataxy, being probably present in at least four out of every five cases of that disease. Buzzard in the first place (1880), and shortly afterward Erb (1880), called attention to the striking analogy between this symptom and the abolition of the knee-jerk, which is one of the most important because it is one of the earliest and most constant symptoms of tabes dorsalis. The iris contracts during the voluntary effort of looking at a near object, but not reflexly to light; the quadriceps crucis is perfectly capable of voluntary contraction, but fails to contract reflexly when the patellar tendon is struck.[4]

Various explanations of the Argyll-Robertson pupil have been proposed. Its discoverer thought it was due to disease of the cilio-spinal region of the cord, causing paralysis of the dilator pupillæ.

Hempel thought the spinal myosis of early tabes was due to paralysis of a pupil-dilating centre in the medulla oblongata; while the reflex iridoplegia was owing to an interruption in the path from optic to the oculomotor nerve, the centre of the latter being normal.[5]

Another theory is that the afferent portion of the light-reflex arc passes from the optic nerve into the cervical cord to influence motor centres there; so that the loss of the reflex would be due to damage to centres or fibre-tracts in the cervical region of the cord.

One of the most commonly accepted theories is that the disease is seated in Meynert's fibres which pass from the corpora quadrigemina down to the oculomotor nucleus; while another is that the lesion is in the fibres passing from the back of the optic chiasm directly through the gray matter of the third ventricle to the third nucleus (Bechterew's tract), or from the optic tract to the same nucleus by the more complicated path described by Darkschewitsch and Mendel, and already alluded to.[6]

Now if, in the meantime, we exclude those theories which localize the lesion underlying reflex iridoplegia outside the cranium, it is plain that writers have almost all been endeavoring to fix on some point in the afferent portion of the reflex arc. There are probably three good reasons for this:

1. The afferent tract is so simple, and, relatively speaking, so easily investigated, that, as disease has never been found in it to account for the symptom, it is the most natural thing possible to look upon the afferent tract as at fault.

To this it may be replied that disease has never been found in the afferent path.

2. The other functions subserved by the oculomotor nucleus (contraction of external ocular muscles, accommodation, contraction of iris during accommodation) are very often perfectly performed, though the light-reflex is abolished, and therefore it is not easy to suppose that the nucleus can be the seat of lesion. If the nucleus were diseased, one should expect considerable variation in different cases with regard to the function first attacked. Why one function out of many discharged by the nucleus should, except in rare cases, be affected before any of the others, and, indeed, often without any other being affected at all, is truly remarkable.

The answer to this argument is as follows :

*a.* It cannot be doubted that contraction of the pupil to light, and contraction during accommodation, or rather during convergence of the visual axes, are subserved by distinct portions of the oculomotor nucleus. Indeed, this nucleus is really an aggregation of small nuclei, each of which has its own appropriate function. Modern research has so far differentiated these nuclei. There is pretty strong evidence that the most anterior part of the third nucleus is a common centre for the three associated actions of accommodation, pupillary contraction, and convergence of the visual axes. Eales published in 1884 a case in which these three functions were lost, whilst all other ocular movements, including the light-reflex, were perfectly preserved.[7]

With respect to the three actions in question, they are so represented in their centre in the following order from before backward : accommodation, pupillary contraction, convergence of visual axes. The most anterior of these nearly corresponds in situation to the most anterior part of the Sylvian aqueduct.

A study of the ocular movements makes it plain that in the voluntary effort to inspect a near object there is first convergence so as to bring the image of the object on the most sensitive part of each retina. Along with this, there is contraction of the pupil to avoid spherical aberration by cutting off the most peripheral rays of light. Finally, there is accommodation to focus the lens for the distance. So far as we can tell, these actions take place simultaneously. But they are not of equal value. Convergence is the essential function, and its centre probably controls the centres for the other two, exactly as the centre for the external rectus controls that for the opposite internal rectus for the purpose of conjugate lateral movement of the eyeballs. A myopic person who, after looking at a distance, tries to inspect an object which is near, and yet beyond his far-point, converges his visual axes, but does not accommodate. In such a case it is not necessary that accommodation should be called into play ; but, under normal circumstances, convergence is not enough for distant vision of a near object, and energy must flow over from the centre for convergence to that for accommodation.

It appears then, to me, that it is strictly in accordance with facts to suppose that the pupil contracts during convergence, owing to activity of the centre for convergence, in the same way as the internal rectus of one eye contracts through activity of the centre for contraction of the contra-lateral external rectus, in connection with a conjugate movement of the eyeballs. On the other hand, pupillary contraction may take place by itself in response to the stimulus of light, though its contraction during convergence is abolished, in the same way as the internal rectus may contract in convergence though incapable of contracting along with the opposite external rectus in conjugate movements.

*b*. The selective action of disease is one of the most familiar facts in medicine. It is well seen in the case of inflammation of peripheral nerves caused by poisons circulating in the blood. Thus alcohol shows a preference for the mixed nerves of the lower extremities, and concentrates upon them the virulence of its attack. Lead selects, as a rule, the motor nerves of the upper limbs. The diphtheritic poison attacks the nervous mechanism of the ciliary muscle and palate; while in the condition known as peripheral neurotabes the damage may be almost limited to the afferent muscular nerves.

Or again, to take the case of a disease of the central nervous system, progressive muscular atrophy, the upper part of the trapezius muscle commonly survives long after the remainder of it has been destroyed by a lesion of the interior cornua, though occasionally the upper part has been seen to suffer early.

It is, therefore, readily intelligible that a certain morbid process should pick out the particular part of the nervous system which is the anatomical basis of the light-reflex.

*c*. As a matter of fact, very considerable variety is met with in the motor ocular affections of tabes. I have calculated the following percentages (stated in round numbers) from statistics quoted by Althaus:[8]

| | | | | | |
|---|---|---|---|---|---|
| Changes of some kind in pupil . . . . | in | 92 | per cent. | of cases | of tabes. |
| Light-reflex lost; pupils act in accommodation | " | 78 | " | " | " |
| Pupils quite immobile . . . . . . . | " | 14 | " | " | " |
| Light-reflex lost; myosis . . . . . . | " | 45 | " | " | " |
| " " " mydriasis . . . . | " | 12 | " | " | " |
| " " " pupil of normal size . . | " | 21 | " | " | " |

With regard to "spinal myosis," Erb found it in 54 per cent., and Althaus found it in over 60 per cent. of tabid patients.

These figures show that loss of the light-reflex is far from being the only affection of the internal ocular muscles in tabes.

I shall now give a short account of a case of my own which was characterized by an exceedingly rare symptom, viz., the converse of the

Argyll-Robertson pupil. That is to say, the pupils contracted in response to light, but not during accommodation.

*Disease of Spinal Cord. Accommodation-iridoplegia without reflex iridoplegia.* Note of February 9, 1892. Patient, who is a seaman, aged thirty-eight, complains of loss of power and disordered sensation in the legs, with pain in the back. His illness began about five months ago, and has got gradually worse. His first symptom was a feeling that the legs were asleep, and, almost at the same time, these limbs became weak. Three weeks ago, pains—as if a knife were cutting him—began to run down his lower limbs from the hips to the feet. These pains begin quite suddenly, are of great severity, and pass off again immediately. The senses of touch and pain are lost below the knees, and are defective higher up. A pin can be pushed into the muscles below the knees without being felt, but an attempt to do this above the knees causes pain. There is numbness with defective sensation along the ulnar side of the left forearm and in the three inner fingers of the left hand. In order to place one leg across the other, the patient had to lift it with his hands. The knee-jerks are abolished and there is no ankle-clonus. Patient states that at present he is quite uncertain as to what he is walking on, but at an earlier stage of his illness he felt as if he were walking on feathers. His back is so weak that he cannot sit up without support. There is a constant gnawing pain in the lumbar and sacral regions. There is a feeling as if a girdle were tied too tightly round his body at about the level of the anterior iliac spines. For some time back, and certainly since before the beginning of his present illness, he has been troubled with diplopia and dimness of vision. His left eye is the better of the two. With this eye alone, he sees objects naturally; but with the right eye alone he sees double. Tested roughly, the visual field of the right eye appears to be defective. The pupils are of medium size and equal. Both contract slightly but distinctly to light, but not the least contraction is observed in accommodation. There are sometimes headache and occasionally giddiness. The bowels are natural. The urine sometimes comes away before he knows, and attempts to restrain it cause pain over the bladder. There is no gastric disturbance. At an earlier stage of his illness, while patient was still able to stand by himself, he required to keep his eyes open and look at the floor to avoid falling. All venereal disease is denied.

Patient has been a seaman all his working-life, and has of late been principally in the tropics. He is disposed to think that his illness was brought on by three weeks' continuous exposure to cold and wet while his vessel was doubling Cape Horn. He says that the men, on coming on deck, frequently got up to the waist or breast in water from the seas that swept the ship, and sometimes they actually swam fore and aft. On going below they wrung the water out of their clothes, left them hanging beside them when they rested, and on getting up had to put the same garments on again. This went on for three weeks, and the cold during that time was intense.

This patient went into the infirmary for three weeks, and afterward called to see me—about a month after his first visit to me. He was now much better. His pains had gone, the ground felt much more natural to his feet, and he could also walk much better. The knee-jerks were still absent, and the peculiar pupillary symptom (accommodation-iridoplegia without reflex iridoplegia) was still observable.

This case is clearly one of spinal disease, and not merely multiple neuritis. But it scarcely conforms to the type of tabes dorsalis. Possibly an acute exacerbation supervened in the course of a more chronic disorder of the spinal cord. The former subsided under treatment and left the latter behind. The anatomical basis of this exacerbation was probably a subacute inflammation of the cord, not confined to the posterior columns.

Besides different forms of paralysis of the internal muscles of the eye in tabes, palsy of one or more of the external muscles is rather common, and indeed there may be complete external ophthalmoplegia. We thus find that in locomotor ataxy all the muscles innervated from the ocular motor nuclei show a tendency to become paralyzed.

3. The idea of an analogy between the loss of the knee-jerk and the loss of the light-reflex is very attractive; and as it is practically certain that the former depends (in tabes) on disease of afferent fibres, those who recognize this analogy (Buzzard, Erb, Althaus) naturaly look for a lesion of afferent fibres to explain the latter also.

Certainly, it must be admitted that the pathological basis of locomotor ataxy—with which disease reflex iridoplegia is chiefly associated—is a degeneration of nerve-fibres in the sensory portion of the nervous system. But we must not let this fact carry us too far. In the region of the spinal cord the lesion is in ordinary cases confined to the sensory system; but within the cranium, while the homologues of the posterior spinal nerve-roots suffer, the disease shows a very marked tendency to invade the motor system. Apart altogether from the pupil-reflex, diplopia, palsy of one or more of the external ocular muscles, and more or less complete ophthalmoplegia are phenomena so frequent in tabes as to demonstrate most plainly that the motor side of the nervous system readily suffers within the cranium.

It is now admitted by all that progressive muscular atrophy, bulbar paralysis, and progressive ophthalmoplegia are strictly comparable diseases, being all due to degeneration of motor cells of the anterior horns of the spinal cord, or of homologous structures in the medulla, pons, and mid-brain. Progressive muscular atrophy and bulbar paralysis are often associated in one individual, and though they rarely become complicated with ophthalmoplegia, this is possibly, as Buzzard suggests,[9] because damage to the nucleus of the vagus causes death before such extension takes place. On the other hand, ophthalmoplegia has, quite rarely, become complicated with evidences of change in the bulb. The three diseases, then, are alike in presenting symptoms (in typical cases) of lesion in the lower segment of the motor path. They are also similar as regards the nature of the lesion. The anatomical changes in the nerve-centres are familiar, so far as progressive muscular atrophy and bulbar paralysis are concerned, and Mr. Hutchinson's case, examined after death by Dr. Gowers, revealed the same kind of lesion in ophthalmoplegia.

Nevertheless one important difference separates muscular atrophy and bulbar palsy on the one hand from ophthalmoplegia on the other, viz., their relationship to syphilis. Syphilis has little, if anything, to do with the two former, from the etiological point of view. In the case of nuclear ocular palsy it appears to be more important than anything else. This has been insisted upon by Mr. Hutchinson all along.

It has been already mentioned that the *ocular* muscular mechanism is the most liable to suffer in tabes when the disease affects the motor system. And as locomotor ataxy is, in the great majority of cases, a sequel of syphilis, it appears to me that the common factor in tabes (with its symptom, the lost knee-jerk) and in reflex iridoplegia may be, not a lesion of the sensory nervous system, but a preceding attack of syphilis.

Additional arguments in support of this view are these: In the first place, the knee-jerk is in excess in ataxic paraplegia, and the pupil-reflex is, as a rule, preserved. At first this seems to be a difficulty, but it turns out to be actually what we should expect, when we recall the fact that syphilis is very rarely the cause of this disease. In exceptional cases, however, there is iridoplegia, and this is—again exactly as we should anticipate—chiefly in syphilitic subjects.

In the second place, loss of the light-reflex is occasionally met with without other nervous symptoms, and in most cases of this kind there is a history of syphilis.

In the third place, general paralysis of the insane is the disease in connection with which, besides locomotor ataxy, reflex iridoplegia is principally observed, and this disease appears to be often, like tabes, a sequel of syphilis.

So far as I am aware, only two writers (Dr. Gowers and Dr. Aldren Turner) have suggested the possibility that the Argyll-Robertson pupil may be due to a nuclear lesion. Even by Dr. Gowers this is implied, rather than stated in so many words. He says that "the loss of function of the internal ocular muscles being persistent, must be ascribed to degeneration of the related centres. But even the light-reflex may return after it has been absent for years, and its loss must therefore depend, at least sometimes, on molecular changes capable of recovery,"[10] Again, he says that isolated loss of reflex action of the iris "is generally due to disease of the centres, degenerative in character."[11] "This has not yet been demonstrated, but hardly admits of doubt because the loss of reflex action occurs under the same conditions as . . . progressive paralysis of the external muscles, the central and degenerative nature of which has been proved."[12] And again, with regard to the ocular palsies of tabes (including loss of the light-reflex), "we have scarcely any evidence at present of the cause of these palsies, but the fact that total nuclear palsy is sometimes met with makes it probable that these also are often of nuclear origin."[13]

An account of the theory just given, that reflex iridoplegia is probably due to degeneration of motor-cells in the third nucleus, was written out some time before I first discovered that Dr. Aldren Turner recognized this a couple years ago as *one of two possibilities.* He concluded that the lesion is "central," viz., either in the antero-lateral group of Darkschewitsch (small cells in the forepart of the oculomotor nucleus), or in Meynert's fibres which connect the oculomotor nuclei with the optic tracts.[14]

The value, as a good working hypothesis, of the theory that the Argyll-Robertson pupil is in almost all cases due to nuclear changes in the mid-brain, will become still more apparent when we consider the causation of spinal myosis. Doubtless the changes are at first merely nutritional, for the exceptional return of the light-reflex after years of absence is probably to be thus explained, but they tend to become eventually organic.

Reference has not yet been made in detail to the other pupillary reflex, viz., dilatation on painful stimulation of the skin. Erb has shown that loss of reflex dilatation is usually associated with loss of reflex contraction. The route of the efferent fibres has been already described. That of the afferent fibres (if the skin of the neck be stimulated) is by the cervical posterior roots and cervical cord upward. Gowers thinks that where "spinal myosis" exists reflex dilatation is probably, in most cases, lost. That is to say, both conditions are in all likelihood due to loss of the energy which ought to pass from the pupil-dilating centre by way of the cervical cord and sympathetic to the iris.

Remak called attention to myosis as a symptom of cervical tabes in 1864; that is, five years before Dr. Argyll-Robertson described the symptom since known by his name. In view of Budge's researches, which suggested the existence of a cilio-spinal centre in the lower cervical cord, it was natural that, after Remak's observation, this part of the central nervous system should be regarded as the probable seat of the lesion which causes myosis. Dr. Althaus concurs in this view and thinks that the cord in this region, or fibres proceeding from it, are at fault.[15]

Hempel's theory is that a pupil-dilating centre in the medulla is paralyzed.

As Hensen and Volckers have shown that the mydriatic nerves originate in the mid-brain, near the anterior end of the Sylvian aqueduct immediately outside the origin of the myotic nerves, and pass thence through the medulla and cervical cord, it appears to me reasonable to assume that the lesion underlying myosis is in this dilator centre in the mid-brain rather than the spinal cord. Weighty reasons can be given in favor of this view:

1. Loss of reflex dilatation and loss of reflex contraction would both be due to changes in the nuclei of origin of the nerves controlling the iris. These nuclei are situated in the immediate neighborhood of one another; the two symptoms are often associated; and they both occur under the same circumstances as, and sometimes in combination with, symptoms which are undoubtedly due to changes in the nucleus of the third nerve.

2. The adoption of this theory would do away with the necessity of assuming the very frequent existence of a lesion of *efferent* fibres in the cervical cord at a very early stage of tabes. In the earlier stage of locomotor ataxy, unless in quite exceptional cases, the only motor nerve structures that are affected are those of the eye. These changes are common and are nuclear—so far at least as morbid anatomy has yet taught us. On the other hand, tabes is often advanced in the lumbar enlargement before even sensory symptoms appear in connection with the cervical cord, and still more before motor symptoms occur in the upper limbs; so that, other things being equal, it is desirable to avoid a theory which implies damage to *extracranial motor tracts* very frequently and very early in tabes.

*Summary.* An endeavor has been made to show that loss of the light-reflex (reflex iridoplegia) and loss of the skin-reflex (cutaneous iridoplegia) are probably both due to degeneration in the nucleus of the third nerve; and that it is unnecessary and undesirable to suppose a lesion of afferent fibres running from the optic nerve to the oculomotor nucleus on the one hand, and of motor fibres in the cervical cord or of a cilio-spinal centre in the cord or medulla on the other. Reasons have been adduced for believing that the analogy between the loss of the knee-jerk and the loss of the light-reflex ought not to be pressed so far as has been done by some authors; and for believing that the Argyll-Robertson symptom ought to be grouped with the other varieties of ophthalmoplegia.

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12. Loc. cit., note.
13. Op. cit., pp. 190, 191, ii. These expressions, quoted from Dr. Gowers, are practically the same as he employed in the first edition of his book (1886-1888).
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# FURTHER OBSERVATIONS ON THE TREATMENT OF SPASMODIC TORTICOLLIS.

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Many years must of necessity elapse before sufficient material can be gathered to enable us to determine whether by any treatment—medicinal, mechanical, or surgical—perfect and permanent cure of spasmodic torticollis can be promised. The experience of the past would indicate that this result will be attained only in a very modest proportion of the well-established and severe cases. In so important a subject it seems justifiable to report early progress rather than to await the final results, since the latter plan in each case requires a long term of years.

Due allowance should certainly be made in early reports for the time, element. Recoveries, apparently brilliant, either from operation or from other treatment, have been followed by disheartening relapses, and, on the other hand, operations, apparently useless, have paved the way for gradual improvement. In reporting progress we have endeavored to supplement recent reports by the later results of cases previously published.

A word upon the pathology may be pertinent. It has recently been objected that the operation is illogical, because no disease of the nerves has been found. If the trouble results from central irritation, no object, it is maintained, is to be subserved by excision of the nerves.

We do not feel that this is a just criticism. The excised nerves, it is true, have been found normal; it is not improbable, therefore, that we have to do with central irritation. But does this fact contraindicate operation? Before considering this question, we would offer the following theoretical considerations as giving a clue to the process.

There is a limit to the amount of continued work which the muscles can endure. In some instances degeneration follows overuse, as in certain forms of muscular atrophy; in others rebellion is shown by spasm, with or without pain. Of the latter condition, writers' cramp and other occupation-neuroses, as well as spasm of ciliary muscles, are familiar examples. If we stop to consider the amount of work put upon the muscles supporting the head, we realize that it is not inconsiderable. From early life these muscles are called upon during the waking hours for almost continuous use. Within certain limits they are fitted for this use. It is safe to say that a person following an ordinary out-of-door occupation, which does not call for a continued constrained position of the head, is not likely to suffer from spasmodic torticollis. When, however, the occupation is such as to require fixing the *eye* intently, whatever the position of the head, another element enters into the question. When we attempt to concentrate in this way the vision we find that the first muscular effort is that of steadying the *head*, without which preliminary it is no more possible to fix the vision than to focus a camera resting upon an unsteady tripod.

The pain in the back of the neck which sometimes follows long-continued writing, more especially in those unaccustomed to this form of employment, and particularly in persons of neuropathic make-up, illustrates in a mild degree the rebellion of the muscles to long-continued effort, accompanied by use of the eyes. If hypermetropia be present, this symptom is aggravated. This pain appears with special readiness when the gaze must be fixed intently on distant objects. Even the comparatively short time required for watching a game of football, in which the interest is so great that the ball is closely followed, is sufficient to produce it. Oculists, by the adjustment of proper glasses, have not infrequently relieved persistent pain not only in the neck, but in the back, between the shoulders, and even lower. Pain in the back as a symptom of eye-strain has never been explained. We would suggest that the muscular effort for steadying the head, already alluded to, must of necessity extend to the back, as forming a part of the base of support. The effort here is so diffused, however, among comparatively large muscles, that pain is produced, as a rule, only in extremely delicate persons.

These considerations are, it is true, merely suggestive, tending to explain one variety only of muscular rebellion to overuse, namely, pain. The fact, however, that spasm offers another variety of such rebellion is a matter of common knowledge. Just why one variety appears in one case, the other in another, and a third offers the combination of both, we are unable to explain. The muscles affected would indicate that *certain movements of the head determine the seat of spasm*, rather than that a central irritation of accidental distribution is at the root of the trouble. By far the most common combination is, as we have already stated, spasm of the sterno-mastoid on one side, and that of the posterior rotators on the other. We have seen only one case in which spasm of all the posterior muscles occurred, drawing the head directly backward; in one case spasm of both sterno-mastoids was the principal symptom. This would indicate that the movement of the head determined the onset of the affection, rather than that cerebral irritation was primary. Such a distribution of primary idiopathic disturbance would certainly be extremely improbable.

Why the rotation should begin and continue in one direction rather than the other, we have not yet been able to determine. With reference to the possible connection between ocular defect and the position assumed in torticollis, Dr. Kilburn has made the following suggestions, which seem to us pertinent: Either hypermetropia or astigmatism may be the predisposing cause of wry-neck. In hypermetropia with one eye, say the left, more affected than the other, the patient by rotating the face away from a near object (in this instance to the left), while tilting the head toward this object, can by this means use as a fixing eye the one requiring the least effort of accommodation. The adoption of this posture removes the left eye (the more hypermetropic) to a greater distance from the point of fixation, and thus lessens the amount of accommodation demanded.

If both eyes are hypermetropic, the stimulus to convergence in excess of the amount required for a given distance, to prevent diplopia, compels a restraining movement on the part of the externi. The nerve-force required by this increased effort on the part of the ocular muscles, added to the labor of an already overtaxed brain, increases the rebellion of the muscles of the neck, to which allusion has been made, whether such rebellion results in pain or in spasm, or in both.

Astigmatism, especially if the principal meridian be oblique, may be a predisposing cause of wry-neck, because a patient with this form of refractive error easily acquires the habit, when reading or writing, of tilting the head to one side, in order to bring his meridian of least refractive error parallel to the vertical lines of the letters.

That the position of the head (even in persons suffering from spasm) is influenced by the refractive condition is, we understand, well recognized among oculists; and insufficiency of ocular muscles seems to be an especially potent factor. Isolated instances in which posture has apparently been replaced by spasm have been cited, but as far as we know no systematic investigation of this point has been instituted. Such investigation would probably lead to interesting, and perhaps to practical results. The demonstration of uniform connection between refractive error, or insufficiency, and spasmodic torticollis would tend to emphasize the importance of correcting such errors before serious symptoms result.

Dr. Cheney has examined the second and third cases reported in this paper with the following results:

Case II.—

V. O. D. with — 2.25 spherical = 1.
V. O. S. with — 2. spherical = 1.
No insufficiency. Fundus normal.

Case III.—There is no insufficiency in either eye. There is hypermetropia of a half-diopter in the right eye. The same degree of hypermetropia exists in the left eye, and in addition moderate astigmatism with oblique axis (angle 105° to 110°).

The latter case would tend to corroborate Dr. Kilburn's proposition as regards astigmatism, but does not aid us as regards the theory that the less hypermetropic eye is turned toward the object of fixation. This patient turned the head to the right, though the left eye (including the astigmatism) showed the greater refractive error; it is not impossible, therefore, that further investigation will develop the exact converse of Dr. Kilburn's proposition in this regard. This would prove equally interesting, and by no means lessen the value of his suggestion.

In the case of the patient alluded to under the question of massage, the spasm involved both sterno-cleido-mastoids, the head being little, if at all, inclined to one side. Dr. Amadon found here astigmatism (0.50) with an axis of 90° in each eye, and esophoria 3°.

In a recent case of combined spasm in which the face was turned to the right and tilted, Dr. Proctor examined the vision at our request and sends the following report:

V. O. D. with — 25 spherical ○ — 0.37 cyl. ax. 175 = 1.
V. O. S. with — 0.75 cyl. ax. 5 = 1.
1 (r) hyperphoria, esophoria (distance) 3°.

This patient had used the eyes to excess in embroidery for three years and a half; the head began to turn three years ago. The time of onset is suggestive, but may be, of course, only a coincidence.

Dr. Shattuck has kindly allowed us to report the ocular examination of an extremely interesting case at present under his care at the Massachusetts General Hospital:

The case is that of a man, aged thirty years; occupation, boarding-house keeper. For fifteen years spasmodic movements of the head had existed in varying directions. The prevailing direction is to bend the head to the right, to retract the chin, and *turn* the face to the left. The sterno-mastoids are rather prominent, but no muscles are especially hard. When the eyes are closed the head is fairly quiet. Dr. Amadon reports that there is rotary nystagmus, excepting when the patient is giving close attention to an object directly in front. There are spasmodic contraction of the obliquus and twitching of the brows and lids in fixing the eyes. Esophoria, 9°:

V. O. D. with — 1 cyl. axis horizontal = 1.
V. O. S. with — 0.50 cyl. axis horizontal = 1.

A connection between the eyes and the neck has already been suggested, with a view to treatment rather than to pathology. The hope has been expressed that correction of errors of refraction or the adjustment of lenses for insufficiency may remedy the difficulty. We formerly shared this hope, and our routine treatment for a long time has included the correction of such errors. Results have been negative, and though we have not abandoned the idea of a connection between ocular effort and muscular spasm, we have been forced to the conclusion that the late correction is unavailing, and that continued fixed use of even the normal eye may be the occasion, though not the direct cause, of rebellion on the part of the muscles supporting the head, especially in the neuropathic individual.

When we speak of the rebellion of muscles, we really mean, of course, rebellion of the cerebral centres supplying them Granting this pathology, or something similar, is it illogical, in the event of other treatment proving futile, to cut off the supply by severing the nerve-connection? The question has been asked, Would a surgeon think of performing neurectomy for writers' cramp? The answer is: If writers' cramp were a distressing affection, totally incapacitating the sufferer; if, moreover, the spasms were limited to certain muscles; and if, again, removal of the nerve-supply to those muscles in no way impaired the usefulness of the hand, the operation of neurectomy should seriously be considered.

Nor are we dealing with an untried problem. Certain results have been obtained by operation, not very brilliant or numerous, it is true, but, on the whole, more satisfactory than those reached by any other method. Cerebral surgery has not been abandoned, though the percentage of success is lamentably small, especially in brain-tumors. The only question here, as there, is, are we dealing with cases otherwise hopeless? It may now be fairly assumed, we believe, that treatment by drugs is useless, that serious cases cannot bear the restraint of apparatus, and that electricity in all forms is ineffective.

The methods which have, possibly, not received as yet a complete trial, are continuous rest in bed, hypnotism, and massage. Each has its advocates, and we await the final result with interest. In one of four cases Dr. Goldthwait has tried the continued-rest treatment for many months without definite result. The patient found that massage increased the pain—a not uncommon complaint. We understand, however, that he has recently consented to a six months' trial of daily massage, as recommended by Dr. Putnam. At our request Dr. Lindstrom in a number of cases has used massage and passive motion for periods of several months, with favorable results in one case only, and that a comparatively mild and recent one (Case IX. of our former report). We have always regarded massage as a useful adjunct to operation, and have observed rapid benefit from its use in convalescence, even in those cases in which it was previously unavailing.

Dr. Coggshall, in a recent communication, has reported favorable results from persistent massage and passive movement. This will encourage us to renew the effort, though, in view of past experience, it must be admitted, with little enthusiasm. We have begun this trial in the case of spasm of both sterno-mastoids, to which allusions have been made. The disease in this instance, though of ten years' duration, is not painful nor excessive, the patient being a rather delicate young woman, anæmic and overworked. She will also have the benefit of vigorous tonic treatment as well as of rest in the hospital.

Few sufferers appeal more strongly to our sympathies than the class under consideration. Those who have seen cases of moderate severity only, or cases rheumatic in character, can hardly appreciate the pain and distress caused by spasmodic wry-neck of the severe type. Such patients are rendered unfit for occupation or society, resting the head either in the recumbent or semi-recumbent position, or unsuccessfully attempting to relieve the spasm by holding the hand to the cheek. Before many years have elapsed they, as a rule, welcome operation, even though only moderate hope of cure is offered.

With regard to the degree of benefit attained: A certain number of cases have been cured; others have been much relieved; if in others the spasm is not increased, we feel that too timid rather than too heroic surgery has been employed. The question presenting itself to the writers is: How far shall we venture? Is it justifiable to remove on both sides more than the spinal accessory nerves, and the three or four posterior branches? As far as paralysis is concerned, it appears from Gardiner's experience that the excision of these nerves does not impair the ability to hold the head erect; even were this not the case, our opinion is that, rather than suffer such torture as we have witnessed, relief should be welcomed, even at the cost of complete inability to support the head, and with the alternative of a supporting collar.

Coming to the present status of our own experience, we have more favorable progress to report than immediate results would have led us to expect.

Case VII. of our former paper,[1] whose spinal accessory alone was excised, after which operation troublesome rotation persisted for a considerable time, rendering a second operation necessary, is now (after an interval of several years) reported free from spasm. Case XI. suffered from spasm of sterno-mastoid on one side and posterior rotators on the other. The case was so severe that the head had to be constantly upon a rest, and even then the hand was held against the cheek to relieve the tension. As is our custom in these cases, the spinal accessory alone was excised at first, the patient being warned that the posterior branches also would probably require operation later. This case has far exceeded our expectations, for at this time, nearly a year after the operation, the head is held quietly, the patient expresses herself as very comfortable, and the only complaint is of pain, not severe, in the side of the neck.

The patient reported as Case VIII., in which operation was advised, but postponed to enable a more hopeful physician to try electricity and other treatment, finally returned for operation in the spring of 1895. There was at that time marked spasm of the sterno-mastoid and of the platysma-myoides on the one side and of posterior rotators on the other, the position being similar to that photographed in our previous paper, but with more depression of the chin. The spinal accessory was excised in the usual manner, and the patient advised to await progress for some months before submitting to the more important posterior operation. Up to this time no improvement has been noted.

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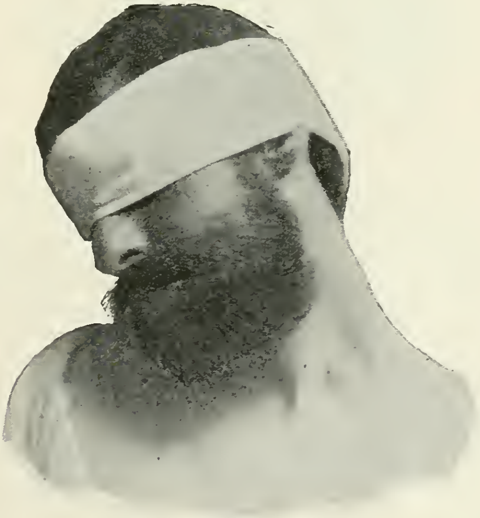
[1] THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES, vol. cix. p. 36.

Case I. of our former communication, one of the most troublesome, in which the improvement after the first operation on one spinal accessory nerve was followed by a relapse and second operation, now carries the head naturally and shows no tendency to spasm.

The tardy nature of the relief in these cases does not militate against the operation as the cause of improvement, when we consider that the patients were growing worse and worse for years up to the time of operation, from which time improvement has been steady, though in some cases gradual.

Case I.—Mr. E. L., aged thirty-five years, music-teacher; a patient of Dr. Davis, of East Somerville, began to have cervical spasms three years ago. In childhood he had been subject to chorea. Dr. Bullard treated him for a year by means of internal medication. From this treatment he received only temporary relief. An attempt was then made by Dr. Lovett to control the spasm with a head-brace, but the apparatus could not be borne. During the past year massage has been used without benefit. Galvanism has also been faithfully, though unsuccessfully, tried.

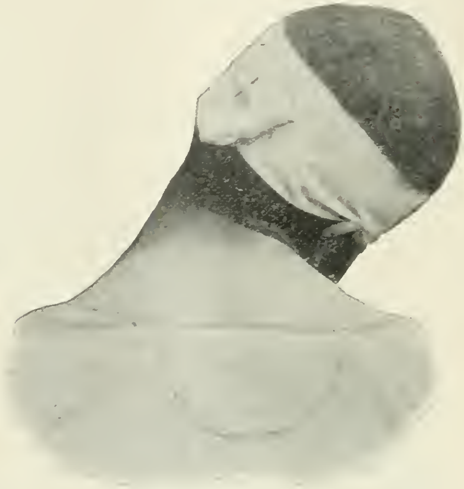
Fig. 1.



Before operation.

The patient was brought to St. Margaret's January 16, 1895. His condition was pitiful in the extreme. The head was so drawn to the right that the ear nearly touched the shoulder. At the same time there was slight rotation to the right. The head, brought originally by intermittent spasm into this position, became finally more or less fixed by permanent contractions. The head, even when he was profoundly etherized, could not be brought to the erect position. Though the opposing movements were thus limited, spasmodic rotation to the right, with inclination toward the shoulder, continued. The patient was deformed; his sleep was disturbed; he could not work; his discomfort at times amounted to agony; life was hardly worth living. He had tried medicines, rest, massage, electricity, and fixation—all without avail. Far from the attitude of dreading, as the last resort, a surgical operation, he welcomed it; he feared rather that an operation would be refused.

FIG. 2.



Spasm of posterior rotators and sterno-cleido-mastoid of *same* side; unusual. Before operation.

After careful deliberation, and in consideration of the fact that every method of relief other than surgical had been faithfully tried, surgical relief was attempted. The patient was etherized January 26, 1895, and placed on his left side. Even in this position the head was held up halfway to the right shoulder, and the contracted muscles stood out as tense cords and bands. A cut was then made from the external occipital protuberance to the sterno-clavicular notch and every contracted muscle was carefully divided. The muscles affected were the trapezius, the complexus, the splenius capitis, the trachelo-mastoid, the obliquus inferior, the omohyoid, and the sterno-mastoid. The deep muscles inserted into the upper cervical vertebræ—the levator anguli scapulæ and the scaleni—were found slightly contracted, but were not cut.

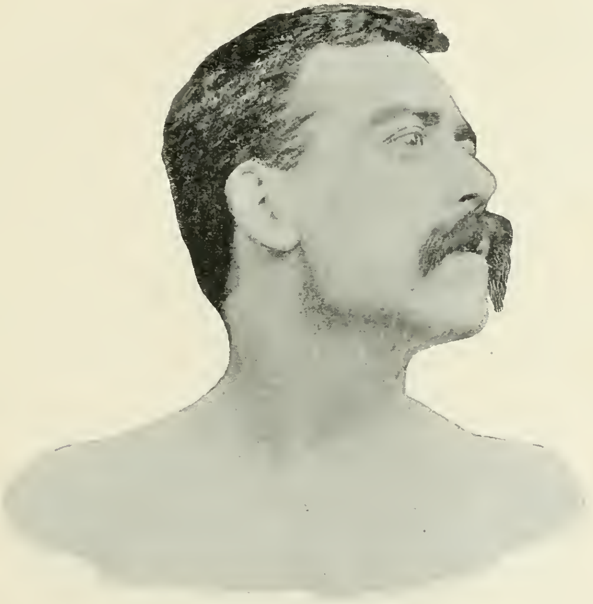
The operation consisted chiefly of a long open incision by which practically every contracted muscle was divided. The posterior branches of the upper four cervical nerves were cut and avulsed.

Union by first intention followed this operation. Convulsive movements ceased immediately, except for a slight twitching of the deeper muscles. After two months' treatment by massage these also ceased. He is now perfectly well. He can hold the head erect, play the piano, and ride a bicycle.

Muscle-division was combined with nerve-section in this case. In Case VII., previously reported, the second operation consisted in complete division of the sterno-mastoid with destruction of the spinal-accessory nerve. The combination of muscle-section with nerve-avulsion, thus carried out with brilliant success, suggested a similar course in the two following cases :

Case II.—Mr. E. F., clerk, entered the Massachusetts General Hospital March 4, 1895. The family history was negative. Up to the beginning of the present trouble he had always been well. Early in September, 1894, he found himself, with no apparent reason for doing so, constantly putting one hand or the other to the head, more often to the right side. The head soon began occasionally to rotate toward the left. This movement increased gradually in force and in frequency. About four weeks before admission to the hospital the head began to be drawn backward as well as to the left. The muscular spasm was accompanied by pain. Various methods of treatment had been used from the beginning of the malady, comprising bromide of potassium, electricity, calisthenics, massage, and hypnotism.

Fig. 3.



Before operation.

Pain was a prominent and distressing symptom throughout the disease.

It extended over the whole head, and was described as severe; so severe, in fact, especially during massage, that this method of treatment was abandoned, though under it there had been apparently some improvement.

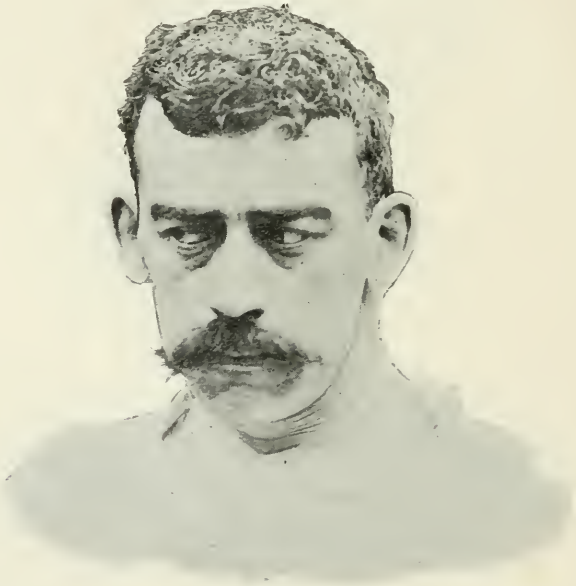
The right sterno-mastoid was found on examination hard and tense, the left trapezius firm and contracted. The trouble began, the patient says, in the region of these muscles. The head was drawn toward the left. All motions of the head were limited.

Fourth day: The patient is being treated in the neurological department with bromide of potassium, electricity, massage, and calisthenics. He is disheartened and anxious for operation, similar methods having been tried unsuccessfully for many months.

Sixteenth day: The patient seems to have more voluntary motion than on entrance; the head is not drawn so far from the median line.

Twenty-third day: He has become anxious and discouraged; he is eager for operation and impatient of delay. Drs. Porter and Warren, in consultation, advise operation.

FIG. 4.



After operation.

About an inch of the left spinal accessory nerve was excised March 31st, through an inch incision made along the anterior border of the sterno-mastoid. The wound was healed by first intention April 5th.

The result of the operation was in the beginning somewhat enouraging. The sterno-mastoid spasm was immediately relieved; the left-sided rotation continued.

In the course of a few weeks spasmodic rotary movements were complicated by a strong backward pull. Examinations were made repeatedly by Drs. Putnam and Walton with a view to avoiding, if possible, further operation. Palliative measures were further augmented by hypnotism, a method which was absolutely unavailing. A second operation was not only agreed to, but urged, by the neurologists and others.

*April* 12, 1895. Second operation. The incision extended from the external occipital protuberance along the anterior border of the trapezius nearly to the clavicle. The posterior nerve-branches of the first, second, third, and fourth nerves were severed, the great occipital alone being spared. The complexus, splenius capitis, and obliquus inferior were completely, the trapezius and trachelo-mastoid partially, severed. The rectus posticus major was not disturbed. The wound united by first intention.

The position of the head was immediately and permanently improved. It was noted in ten days that the "head is carried much straighter; flexion and extension are good. He can rotate the head to the right nearly 45°. The muscles that now pull are the platysma and the omohyoid."

*May* 2*d*. His condition is greatly improved, and movements are much freer. Spasm is now insignificant. The head was done up in plaster-of-Paris, which had to be removed on account of the pain and discomfort which it caused. He was discharged relieved May 3d.

*December*. He now holds the head somewhat to the right of the median line, but in a fairly erect position. His chief and, in fact, only complaint is the restriction of voluntary motion to the right, due not to muscular weakness, but in part, at least, to the binding effect of the cicatricial tissue. He says that he would rather have all the muscles paralyzed and the head in a collar than to revert to his previous condition.

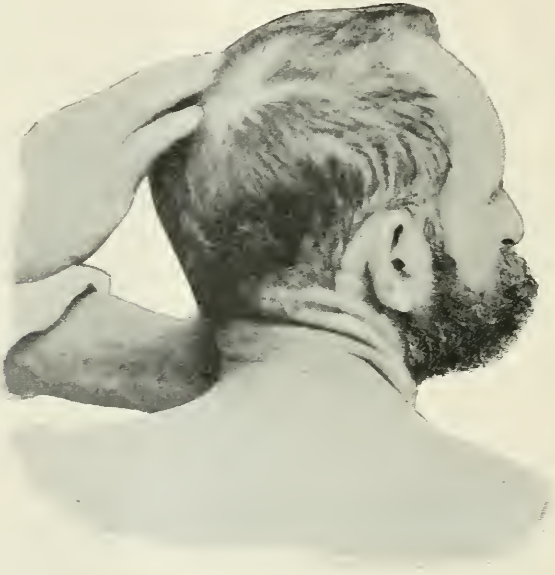
*Third operation*, 1896. Slight spasm of the left sterno-mastoid muscle had recurred. The left spinal accessory nerve was found at the outer border of the sterno-mastoid muscle and traced backward and upward. It was found that the nerve had become restored at points of division at previous operation. The nerve was extensively destroyed and the muscle partially severed. This operation removed the last traces of spasm.

Case III.—September 18, 1895. C. B., aged forty-two years, grocer, patient of Dr. Woodbury, of Groveland, and Dr. Anthony, of Bradford, began three or four months ago to have "turning of the head." He noticed it especially when he was writing orders. This turning steadily increased until it became an almost incessant and uncontrollable spasm.

Four months before, in May, 1895, in helping lift a horse that had broken through the barn floor, he felt "something break in the neck." As a result he carried his head for a while on one side. Dr. Richardson found, September 18, 1895, a spasmodic condition of the left sterno-mastoid muscle in conjunction with that of the right posterior rotators. The movements of the head were incessant and painful. In this case, in view of the severity and pain of the spasm, especially in the sterno-mastoid, no palliative measures were advised. The left spinal accessory nerve was immediately excised. The wound healed by primary union. Only slight benefit followed this operation, although the sterno-mastoid was immediately relieved from spasm and the pain lessened. Rotary and backward motions persisted. He was very much discouraged by this result. In October, when he entered the Massachusetts General Hospital for observation, the head was rotated to the right and bent backward. The second day after entrance a plaster helmet was applied, which the patient was unable to endure, after a few hours' trial, on account of extreme pain. Fixation aggravated so intensely the previous discomfort and pain that this method was absolutely impracticable. Opposition to the spasm only increased the violence of muscular contraction.

On the fourth day partial immobilization was attempted by means of sandbags, with the result of increasing the spasm. Manual fixation demonstrated vividly the rebellious nature of the muscular paroxysm. Slight pressure would for a time control this contraction ; firm pressure increased it ; forcible pressure produced a tonic and painful paroxysm. Dr. Richardson being decidedly averse to further operation, referred the case with full powers to Drs. Putnam and Walton. Both became convinced of the inutility of palliation and urged operation upon the posterior rotators. Neither was willing even to consider the usual preliminary measures of massage, calisthenics, electricity, and hypnotism. In view of the remarks of Dr. Goldthwait made upon our previous communication, the patient was then referred to him for observation and for treatment. Dr. Goldthwait reported against palliation ; he thought that mechanical treatment would be a waste of time.

FIG. 5.



Before operation.

*Operation.* The patient was etherized and placed face downward over the end of the table. The extending muscles were thus put upon the stretch. A long incision was made from the occiput toward the scapula, parallel with the fibres of the trapezius. The muscles were separated and divided until the posterior branches of the four upper cervical nerves were found, of which all branches were avulsed, including the great occipital. Most of the muscles were also cut across, the trachelomastoid alone remaining intact.

*December 5th.* The head still rotates to the right, though with less violence than before and with longer intermissions. One of the deep muscles, apparently the trachelo-mastoid, can be felt to harden spasmodically during rotation. This is the nerve, the patient states, which has seemed to him the principal cause of the trouble throughout. Massage is begun to-day.

11*th.* Examination shows a strong spasmodic contraction of the trapezius and of the trachelo-mastoid. It is proposed to treat these muscles persistently by massage and by other remedies; in the event of failure after a reasonable time, free division of the remaining fibres will be made.

13*th.* Daily massage has been continued up to the present time. From the beginning of this treatment the spasm was considerably relaxed.

14*th.* The head is now fairly quiet. The trapezius and trachelomastoid spasm seems to have largely disappeared, though after being up and about for some hours it reappears to a moderate extent.

This patient, like the last, expresses himself as greatly pleased, and states that rather than return to his previous condition he would choose to have all muscles paralyzed and wear a collar.

He adds that he was formerly so helpless that he could not sign checks, dress or feed himself. He gave his chief-clerk power of attorney for the former purpose, and required the assistance of his wife for the latter. When he attempted to go through a door he was in danger of striking the doorway. He used to sit holding his head in both hands, with elbows resting on something. He once attempted to ride, resting the elbows on the seat before him, but had to discontinue after riding a mile on account of distress.

This patient was discharged December 14th. Whether this improvement is permanent or not we cannot say. The absolute immobilization by the operation of the greater portion of those muscles which produce the spasms may have relieved, in some obscure way, the one or two remaining muscles. It seems not impossible that those muscles remaining unimproved in an extensive co-ordinating group, the others of which have become for the time being paralyzed, may through their altered nerve-supply, or from some other cause connected with the operation, have been unable further to give expression, by spasm or otherwise, to the central or other source of irritation; they may be too limited in size and in function to carry the burden of rebellion before distributed among so many muscles. On the other hand, we frequently see spasms shift from a single muscle to an extensive group, as in all those cases in which the posterior rotators become involved after avulsion of the spinal accessory. The burden of giving expression to the irritation is thereby divided, but we have never seen the spasm go further than this.

Benefits received from an operation *per se* are likely to be observed in those cases only in which massage, electricity, gymnastics, and especially hypnotism have been most helpful—cases in which operative measures are seldom needed. Excepting in one case (XI.), we have failed to observe improvement in any set of affected muscles by the cure by operation of an associated group. On the contrary, spasm, as a rule, becomes more pronounced ; for example, paralysis of the left sterno-mastoid and trapezius may be followed by increased posterior spasm, or it may even be followed by the spasm of these muscles when none existed before. It can hardly be said, therefore, that operative measures *per se* have any favorable influence upon allied groups of real muscular spasm.

In view of a recent discussion of this subject, renewed hope of the benefits of massage, gymnastics, and hypnotism has been encouraged, and we await with interest further trials of these methods in aggravated cases. Surgical measures should certainly not be instituted until every rational means of non-operative treatment has been exhausted, unless the case is too well established and severe to justify delay. It may then be resorted to, not as an untried experiment, but as a rational surgical procedure, based upon a by no means discouraging experience.

# A CONTRIBUTION TO THE STUDY OF LACTATION-ATROPHY OF THE UTERUS.

By Hiram N. Vineberg, M.D.,
ATTENDING GYNECOLOGIST TO THE MOUNT SINAI HOSPITAL DISPENSARY AND TO THE MONTEFIORE HOME FOR CHRONIC INVALIDS.

It is singular that in this country the subject of lactation-atrophy of the uterus has received absolutely no attention. What is even more singular is that the condition seems entirely to have escaped observation. The several excellent works on gynecology emanating from American authors are exceptionally silent on this subject. A slight incidental notice is to be found in the *The American Text-book of Gynecology*,[1] in the following terms : " The condition known as hyper- or super-involution follows labor and is due to causes unknown. The natural involution of the uterus following labor reduces the size of the organ slightly below its normal condition, but subsequently within a few weeks this loss is regained."

In *The American System of Gynecology*,[2] Dr. T. A. Reamy, in the article on subinvolution, briefly states : " After parturition the uterus rapidly decreases in size until in four to six weeks it has reached its former weight or as nearly so as it will ever do."

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[1] W. B. Saunders, Philadelphia, 1894, p. 213.

[2] Lea Bros. & Co., 1887, vol. i. p. 645.

The opinion that prevails and the teaching that is promulgated are that a uterus that has ever borne a child never returns to its virginal size unless as the result of pathological changes. Thus says Lusk, in *The Science and Art of Midwifery*:[1] "In six weeks the process (involution) usually reaches the end, though the uterus remains ever after somewhat larger and more rounded than in nulliparæ." In the same strain speaks S. C. Busey in *The American System of Obstetrics*:[2] "A womb which weighed more than two pounds immediately after labor, will not weigh more than three-quarters of a pound at the beginning of the third week, and usually at the close of the sixth week the process is completed, but the uterus never resumes the size and shape of a nulliparous organ."

Parvin, in his text-book on *Obstetrics*, does not mention the subject.

The condition to which I wish to draw your attention is not that which is usually known here as *hyper-involution*, a condition very rarely met with and usually permanent. It is to that form of hyper- or super-involution accompanying lactation, with or without amenorrhœa, and in which the reduction in size is temporary only, the return to the normal size being in some cases dependent upon the cessation of lactation, in others again regeneration of the uterine tissue occurring while lactation is still going on.

My attention was especially drawn to this condition a few years ago when I first took charge of my service in the gynecological department of the Mt. Sinai Hospital Dispensary. A great number of nursing-women of all periods present themselves there for treatment suffering from a variety of symptoms. As I made it a rule, from the outset, to examine every woman that came, no matter how trivial the complaint, I was soon struck with the small size of the uterus that I encountered in a great number of the nursing-women. In the majority of cases there was no or only a trifling lesion, and the symptoms complained of could be referred to constipation, indigestion, malnutrition, or to the function of lactation itself. A more extended observation soon taught me that the atrophy was only temporary, as the uterus would sooner or later increase in size and the function of menstruation be re-established. With the recurrence of menstration the process of gestation in many cases would recur; in others, again, conception would take place without the reappearance of the menses. My hitherto views, based on what I had been taught regarding puerperal involution, had to undergo a change. and I sought enlightenment in the literature on the subject. This as yet is very meagre, and is to be found chiefly in the German journals The two authors who have written the most extensively on the subject

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[1] D. Appleton & Co., 1884, p. 233.

[2] Lea Bros. & Co., 1889, vol. i. p. 522.

Engström, of Sweden, and Thorn, of Germany, are at variance as to the significance of the atrophy, whether it is to be considered as pathological or as normal. Engström holds that it is consequent upon the lowered vitality and the anæmic condition usually accompanying lactation. He would place it in the same category as the atrophy that occurs in constitutional disease, such as phthisis, syphilis, etc. Thorn, on the other hand, while admitting that these conditions may play a *rôle,* in some instances, to a greater or less degree, is firmly convinced that the process is a normal one and may be met with in the most robust individuals under the most favorable hygienic surroundings.

The result of my own investigations I shall now place before you, and, as you will see, they serve to confirm Thorn's views.

The first question we have to ask ourselves is, What must we consider as atrophy of the uterus? P. Müller, in his excellent monograph on the physiological and pathological involution of the puerperal uterus, has given the following answer. He says a uterus may be termed atrophic when after the puerperium it assumes a size less than that of the virginal organ. But a uterus that has once gone through the puerperal process, and when the period of lactation has elapsed is generally somewhat larger than the non-parous uterus; *i. e.,* its cavity is from 1 to 1.5 cm. longer, and its walls are about 0.5 cm. thicker. The parous organ, therefore, should give a measurement of from 7.5 cm. to 8 cm. We must, therefore, consider as atrophic or hyper-involuted that uterus which has borne a child and which in any of its dimensions measures less or the same as that of a healthy multipara (Engström). But when the uterus is much smaller than the multiparous organ, when it is only two-thirds its size, or, as in some cases observed by me and others, not more than half its size, then the term atrophy is certainly appropriate. We know that certain pathological processes during the puerperium, such as severe septic infection of the uterus, ovaries, or parametria, may result in atrophy of the uterus. These cases are excluded from this communication. I will only consider such cases in which the puerperium was normal or nearly so.

Two varieties of lactation-atrophy are recognized—the eccentric and the concentric. The term eccentric atrophy is applied to a uterus whose cavity is of the same depth as the ordinary parous organ, but whose walls are appreciably thinner and more flaccid. When the organ is decidedly smaller in all its dimensions, when the cavity from the fundus to the border of the anterior lip of the cervix does not measure more than 4.5 cm. to 6.5 cm., and the uterine walls are thinner than normal, though they may not be flaccid, the term "concentric atrophy" is employed. Concentric atrophy may, therefore, be considered as only a higher grade of the eccentric variety. As may be anticipated, various grades between the two varieties are met with. The terms are merely arbitrary, but serve the useful purpose of concisely designating the degree of atrophy. It is not uncommon to meet with an excentric atrophy which under continued lactation becomes concentric.

According to my observations, the process affects the body and the cervix equally. In some of my cases, it is true, the cervix was much larger in proportion than the body, but it seemed to me that the enlargement was due to a pathological lesion, such as a bad laceration or an accompanying endocervicitis. These observations harmonize with those of Engström and Müller. Thorn, however, states that in his cases the cervix remained unaffected and that it showed atrophy only in the very highest grades when the external genitalia and the abdominal walls may also become involved in the process. Gottschalk drew similar conclusions from his cases.

Both Engström and Thorn agree that the ovaries do not undergo any appreciable atrophy unless in a few very marked cases. Kleinwächter asserts that they were markedly atrophied in all of his cases, but his cases do not truly belong to lactation-atrophy, inasmuch as they were instances of permanent hyper-involution following the puerperium and lactation.[1] In none of my cases could I detect by bimanual examination any notable decrease in the size of the ovaries. This was in spite of the fact that the majority of women afforded a good opportunity for such an examination, having flaccid and yielding abdominal walls.

What is the earliest period at which we may meet with lactation-atrophy? Reluctantly, on account of their source, I must concur with Hansen in excluding the measurements of the puerperal uterus given by two American authors, Drs. Sinclair and Richardson, in 1878 and 1879.[2] They are ostensibly unreliable, but in justice to these gentlemen it must be added that the measurements were not made by themselves, but by the then incumbent house-surgeons. These measurements give already as early as the tenth day a depth of the uterine cavity of only two inches. Some measured only one and three-quarters inches on the fifteenth day. In looking over these tables one is amazed at the circumstance that in the majority of instances a higher measurement obtained from the twentieth to the thirtieth day than from the tenth to the fifteenth day. Hansen explains this by the observation made by Börner, that from the tenth to the fifteenth day the puerperal uterus generally lies in acute anteflexions. He says it is evident that the sound was arrested by the flexion at the internal os, and hence denoted the depth of the cervix only. This observer, having in view the medico-forensic aspect of the subject, made careful measurements in a large number of puerperal women of various periods, ranging from the second to the twelfth week. One series comprised 76 healthy nursing-primiparæ. Already at the sixth week many gave a measurement only of 7 cm., and in three the uterine cavity measured only 6.5 cm. The minimum measurement was 5.4 cm.

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[1] What is remarkable about his observations is that they comprise 28 of such cases in 3000 polyclinic gynecological cases.

[2] Transactions of the American Gynecological Society, vols. iv., vi., vii.

P. Müller obtained a measurement of 6.5 cm. as early as the twenty-first day. His minimum (5 cm.) occurred only after the sixth week.

My own measurements embrace the cases (51 in number) seen by me during the past eight months, and are tabulated in the appended tables. The period of lactation varied from seven weeks to twenty-four months. They are the only ones recorded covering so extensive a period of lactation. They were all made by myself, and in many instances two or more measurements for purposes of control were made on the same individual. The size, shape, consistency and position of the uterus were always first noted by a careful and thorough bimanual examination. To my mind this examination by one who is in the habit of examining daily a large number of women is eminently of greater value than the measurement with the sound. By it alone, without hearing the history from my assistants, I could frequently recognize that the woman was nursing. Th determination of cases of excentric atrophy must depend upon this examination solely, for the sound would only indicate a normal depth. After the bimanual examination a bivalve speculum was passed, the anterior lip caught with a tenaculum, and a sound, rendered aseptic with the flame of a spirit-lamp, was passed to the fundus. The sound was held in position, while the speculum was withdrawn ; the index-finger was then passed to the anterior lip of the cervix and the sound withdrawn with the finger held firmly against it. Even in a matter apparently so simple the greatest care in details is necessary to avoid error. For instance, care must be taken that on removing the speculum the knob of the sound does not slip away from the fundus. The measurement should be taken from the border of the anterior lip, for in case of a tear of the cervix, if the finger be applied to its side, the tip of the finger would enter the cervical canal for a greater or less distance and a shorter measurement would be obtained than actually existed. It has frequently been my experience to obtain a greater depth of measurement with the sound than I had anticipated from the prior bimanual examination. Doubtless the uterus becomes somewhat lengthened by drawing on its anterior lip with the tenaculum. The minimum measurement obtained was 4 cm., the maximum was 8 cm.

In order to determine what part, if any, anæmia and general debility played in the causation of the process in question, the color of the superficial mucous membranes was noted in each case as well as the general appearance of the woman. These are designated in the tables by one or two terms for brevity' sake. To test this matter more fully and accurately an examination of the blood was made in fourteen of the patients by my friend, Dr. Max Rosenberg. I wish here to express my deep sense of gratitude to the doctor for his painstaking labor and for the thoroughness with which the examinations were made. A much greater number of the women were requested to present themselves to Dr. Rosenberg, but only the above-stated number complied with the request. Inasmuch as the desire was for an impartial investigation no attempt at selection of the cases was made for this examination.

If we assume that about 4,500,000 is the normal number of red blood-corpuscles in the female (Vierordt, Laache[1]) there was only one case (No. 40) in which the number was much below this. In 8 of the cases it far exceeded that average; in the remaining 5 cases it was only slightly below it. It will be observed that in cases Nos. 18, 21, and 40 some discrepancy obtains between the condition as noted by me and the result of the blood-examination. In cases Nos. 18 and 21 I noted "anæmia," while the number of red blood-corpuscles was 4,975,000 or 5,470,000, and the percentage of hæmoglobin 70 and 80 per cent. respectively. In case No 40 the general appearance is said to be good, while the counting of the red blood-corpuscles gave a number of only 3,685,000, and the hæmoglobin a percentage of 65. It is unnecessary to comment upon this any further than to say that the counting of the red blood-corpuscle must be considered an essentially safer guide than the ocular inspection of the mucous membranes, or the impression gained from the rapid survey of an individual.

From a study of both tables it will be seen that anæmia and debility were not important features in the production of the atrophy.[2] It is true that some of the women presented the appearance of anæmia to a greater or less degree, but the hyper-involution was no more fully developed in them than in those of a healthy and robust appearance. On the contrary, of the fourteen women in the second tabulated series, the smallest uterine measurement (4 cm.) was found in one (Case No. 21), whose red blood-corpuscles numbered nearly 5,500,000 in a cubic mm., and in whom the percentage of hæmoglobin was 80. Still further during my investigations I came across several nursing-women not included in the tables who showed very marked anæmia and lowered vitality, but in whom, instead of finding a small uterus, I found a uterus considerably enlarged; in other words, the condition known as subinvolution. The administration of iron and the application of pelvic massage thrice weekly for three or four weeks in these cases would usually result in

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[1] Vierordt's Medical Diagnosis. W. B. Saunders, Philadelphia, p. 275.

[2] Of course, it must be admitted that the disproportion between the number of red blood-corpuscles and the quantity of hæmoglobin corresponds with what obtains in chlorosis, but where the percentage of hæmoglobin is above 60 per cent. a chlorotic condition can scarcely be said to exist. The difficulty in determining the exact quantity of hæmoglobin must also be taken into account. It can only be accurately made by quantitative spectrum analysis (K. Vierordt). I give the figures as they are furnished to me, leaving it to future investigators to decide this very important matter. My own belief at the present time is that chlorosis was not present, save with one or two exceptions, in the women in whom the blood-examinations were made.

| No. | Age of patient. | Married. | No. of children. | Age of baby. | Menses. | General appearance. | Bimanual examination. | Depth of uterine cavity. | Local lesion. |
|---|---|---|---|---|---|---|---|---|---|
| | Years. | Years. | | | | | | Cm. | |
| 1 | 30 | 12 | 5 | 3 mos. | None. | Good. | Two-thirds normal size. | 5.0 | None. |
| 2 | 21 | 1 | 1 | 3 " | " | Very good. | Some smaller. | 6.5 | Slight endocervicitis; cervix small. |
| 3 | 22 | 3 | 2 | 6 " | " | " " | Half size. | 5.0 | Slight erosion on anterior lip. |
| 4 | 23 | 4 | 2 | 6 " | " | " " | Small, and thin walls. | 5.5 | None. |
| 5 | 20 | 2 | 1 | 11 " | " | " " | Cervix large; body small. | 5.5 | Moderate endocervicitis. |
| 6 | 29 | 9 | 5<br>1 misc | 5 " | " | Very robust | Cervix very large; body small. | 6.0 | Deep bilateral tear. |
| 7 | 27 | 4 | 3 | 4 " | " | Good. | Cervix normal size; body small. | 7.0 | None. |
| 8 | 25 | 6 | 4<br>1 misc | 3 " | Metrorrhagia. | Very good. | Cervix very small; body half size. | 4.5 | Endometritis. |
| 9 | 29 | 10 | 5 | 8 " | None. | Very robust | Very small. | 4.5 | Retroversion. |
| 10 | 32 | 14 | 5 | 24 " | Set in 3 months ago. | Good. | Small. | 6.5 | None. |
| 11 | 39 | 18 | 10<br>1 misc | 4 " | None. | Very good. | Two-thirds size. | 5.0 | " |
| 12 | 31 | 12 | 8 | 8 " | " | " " | Very small. | 5.0 | " |
| 13 | 40 | 20 | 6 | 6 " | " | " " | Very small. | 5.0 | " |
| 14 | 22 | 3 | 1 | 5 " | " | Robust and full color. | Small, and thin walls. | 6.5 | " |
| 15 | 23 | 2 | 1 | 12 " | Set in a week ago. | Slightly anæmic. | Very small. | 5.5 | Retrodisplacement. |
| 16 | 27 | 8 | 4 | 15 " | None. | Good. | Half normal size. | 4.5 | None. |
| 17 | 25 | 3½ | 2 | 9 " | " | Good color and robust. | Half normal size. | 4.5 | " |
| 18 | 20 | 2 | 1 | 6 " | " | Slightly anæmic. | About normal size. | 7.5 | " |
| 19 | 34 | 15 | 6<br>1 misc | 6 " | " | Very good. | Cervix large, body very small. | 4.5 | Moderate endocervicitis. |
| 20 | ... | ... | ... | ...... | " | Very anæmic. | Less than half size. | 4.0 | |
| 20[1] | ... | ... | ... | ...... | ...... | Good color. | Less than half size. | 4.0 | |
| 21 | 23 | 2 | 1 | 8 mos. | None. | Anæmic. | Less than half size. | 4.0 | |
| 21[2] | " | ... | ... | ...... | Set in a month ago. | " | About normal size. | 7.5 | |
| 22 | 30 | 8 | 4 | 11 mos. | None. | Good. | Rather small. | 6.5 | Retroversion, second degree. |
| 23 | 27 | 10 | 3 | 8 " | " | Very good. | Very small. | 5.5 | |
| 24 | 23 | 12 | 6 | 4 " | " | Good. | About half size. | 4.0 | |
| 25 | 23 | 4 | 2 | 4 " | " | Very good. | Very small. | 5.0 | Bilateral laceration. |
| 26 | 26 | 5 | 3 | 8 " | " | Plethoric. | Cervix large, body very small. | 4.0 | |
| 27 | 23 | 3 | 2 | 4 " | " | Fairly good | Cervix large, body very small. | 4.5 | |
| 28 | 37 | 18 | 7<br>6 misc | 8 " | " | Very anæmic. | Thin walls. | 6.5 | Retroversion, first degree. |
| 29 | 22 | 2 | 1 | 2½ " | " | Very good. | Cervix very small, body small, | 5.5 | |

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[1] Six weeks later, during which time took iron.

[2] Two months later.

| No. | Age of patient. | Married. | No. of children. | Age of baby. | Menses | General appearance. | Bimanual examination. | Depth of uterine cavity. | Local lesion. |
|---|---|---|---|---|---|---|---|---|---|
| | Years. | Years. | | | | | | Cm. | |
| 30 | 25 | 2 | 1 | 12 mos. | Set in 4 months ago. | Slightly anæmic. | About two-thirds normal size. | 6.0 | |
| 31 | 27 | 8 | 4<br>1 misc | 9 " | None. | Anæmic. | Cervix large, body thin walls. | 7.5 | Bilateral laceration. |
| 32 | 22 | 1 | 1 | 7 wks. | " | Good. | Thin walls and below normal size. | 6.5 | |
| 33 | 29 | 10 | 5 | 7 mos. | " | Very good. | Very small. | 5.0 | Retroversion, first degree. |
| 34 | 26 | 6 | 4 | 10 " | " | Good. | Small. | 6.0 | |
| 35 | 30 | 10 | 5 | 7 " | " | Very good. | Very small. | 6.0 | Retroversion, first degree. |
| 36 | 21 | 2½ | 2 | 3 " | " | " " | Very small. | 6.0 | |
| 37 | 22 | 2 | 1 | 8 " | Profuse for 2 months. | Very anæmic. | Flabby and thin walls. | 8.0 | |
| 38 | 33 | 10 | 4 | 14 " | None. | Good. | Two-thirds normal size. | 4.5 | None. |
| 39 | 25 | 6 | 2 | 17 " | Set in 4 months ago. | Fair. | Slightly below normal. | 6.5 | " |
| 40 | 24 | 1¼ | 1 | 11 wks. | None. | Very good. | Very small. | 5.0 | " |
| 41 | 27 | 8 | 4 | 15 mos. | Set in 2 months ago. | Fair. | Two-thirds normal size. | 5.0 | " |
| 42 | 30 | 15 | 8<br>1 misc | 3½ " | None. | Good. | Small. | 5.5 | Erosion of cervix. |
| 43 | 22 | 2 | 1 | 5 " | " | Anæmic. | Small. | 5.5 | None. |
| 44 | 34 | 16 | 5 | 8 " | " | Very good. | Small. | 5.0 | " |
| 45 | 38 | 23 | 7 | 3 " | " | Very anæmic. | Thin walls. | 7.0 | " |
| 46 | 25 | 1 | 1 | 7 wks. | " | Very good color. | Not easily defined. | 6.5 | " |
| 47 | 27 | 5 | 2 | 8 mos. | Set in 3 weeks ago. | Very good color. | Small. | 6.5 | Bilateral laceration. |
| 48 | 30 | 2 | 1 | 7 " | None. | Plethoric. | Not palpable owing to thick abdominal walls. | 6.0 | Bilateral laceration. |
| 49 | 30 | 8 | 5 | 6 " | " | Fair. | About half normal size. | 5.0 | None. |
| 50 | 25 | 1 | 1 | 7 wks. | " | Very good. | Below normal size. | 6.5 | " |
| 51 | 38 | 18 | 7 | 13 mos. | " | Fair. | Half size. | 4.5 | Endometritis. |

| | I. Case No. 2. | II. Case No. 3. | III. Case No. 6. | IV. Case No. 8. | V. Case No. 14. |
|---|---|---|---|---|---|
| No. of red blood-corpuscles . . . (Estimated according to Thoma-Zeiss, 64 squares). | 5,050,000 | 5,250,000 | 4,375,000 | 4,250,000 | 5,100,000 |
| Percentage of hæmoglobin . . . (Estimated according to Fleischl). | 70 per ct. | 70 per ct. | 70 per ct. | 70 per ct. | 75 per ct. |
| Absolute quantity of hæmoglobin . | 9.8 gm. | 9.8 gm. | 9.8 gm. | 9.8 gm. | 10.5 gm. |
| Size of uterus . . . . . . . . (Estimated bimanually.) | Smaller than normal | Half normal size. | Cervix large body small. | Half normal size. | Small and thin walls. |
| Depth of uterine cavity . . . . (Measured with sound.) | 6.5 cm. | 5.0 cm. | 5.5 cm. | 4.5 cm. | 6.5 cm. |

| | VI.<br>Case No. 18. | VII.<br>Case No. 21. | VIII.<br>Case No. 25. | IX.<br>Case No. 29. | X.<br>Case No. 34. |
|---|---|---|---|---|---|
| No. of red blood-corpuscles . . . (Estimated according to Thoma-Zeiss, 64 squares). | 4,975,000 | 5,470,000 | 4,760,000 | 4,150,000 | 6,100,000 |
| Percentage of hæmoglobin . . . (Estimated according to Fleischl). | 75 per ct. | 80 per ct. | 70 per ct. | 65 per ct. | 85 per ct. |
| Absolute quantity of hæmoglobin | 10.5 gm. | 11.2 gm. | 9.8 gm. | 9.1 gm. | 12.1 gm. |
| Size of uterus . . . . . . . . (Estimated bimanually). | About normal size. | Less than half size. | Very small. | Very small. | Small. |
| Depth of uterine cavity . . . . (Measured with sound.) | 7.5 cm. | 4.0 cm. | 5.0 cm. | 5.5 cm. | 6.0 cm, |

| | XI.<br>Case No. 40. | XII.<br>Case No. 49. | XIII.<br>Case No. 50. | XIV.<br>Case No. 51. |
|---|---|---|---|---|
| No. of red blood-corpuscles . . . (Estimated according to Thoma-Zeiss, 64 squares). | 3,685,000 | 4,150,000 | 6,500,000 | 4,150,000 |
| Percentage of hæmoglobin . . . (Estimated according to Fleischl). | 65 per ct. | 65 per ct. | 80 per ct. | 60 per ct. |
| Absolute quantity of hæmoglobin | 9.1 gm. | 9.1 gm. | 11.2 gm. | 8.4 gm. |
| Size of uterus . . . . . . . . (Estimated bimanually.) | Very small. | Half normal size. | Below normal size. | Half size. |
| Depth of uterine cavity . . . . (Measured with sound.) | 5.0 cm. | 5.0 cm. | 6.5 cm. | 4.5 cm. |

improved color and health of the patient. Coinciding with this general improvement there would occur a diminution in size of the uterus and a condition of hyper-involution would be reached. The following are typical examples of many such cases:

Case I.—Mrs. K., a healthy, though undersized, woman, aged twenty-four years; married five years; was delivered of her third child by me twelve weeks ago. She had a normal and easy labor. There was the usual amount of blood lost at the end of the third stage. Her puerperium was afebrile and uneventful. She was allowed to sit up on the twelfth day. She nursed her baby, a robust boy, who required considerable nourishment. At the end of the seventh week she was markedly anæmic, the superficial mucous membranes being almost white. The uterus, on bimanual examination, was about the size of the gravid organ at the sixth week. She was given iron, enjoined to drink considerable milk, and the uterus was *masséed* three times weekly. Now, at the expiration of five weeks' treatment, though she has continued to nurse her infant, she has good color and feels much stronger. The uterus is soft, is smaller than the parous organ, and by the sound gives a measurement of 6.5 cm.

Case II.—Mrs. O., aged thirty-four years; married fifteen years; seven children; was delivered of her last child, which she is nursing, six weeks ago. She had a normal labor and puerperium, but was exceedingly anæmic and is very feeble; could scarcely stand for ten minutes without trembling from sheer weakness. The uterus was about the size of the gravid organ at the sixth week, and measured 9 cm. She was treated with pelvic massage, ichthyol tampons, and given the tincture of chloride of iron and strychnine internally. Six weeks later, in spite of the continued nursing, she had good color, felt quite strong, and was able to do her housework. The uterus now measured only 7 cm.

The next case, though not attended with lactation, furnishes, however, incontrovertible evidence that constitutional disease and anæmia do not always bring in their train hyper-involution of the uterus as held by Engström and others.

Case III.—Mrs. Z., the wife of a colleague, at about the seventh month of her first pregnancy was attacked with dry pleuritis. For the next five or six weeks she had fever off and on and pain in the right side of the lower part of chest and upper part of abdomen. Evidences of effusion were noticed at about the eighth month. She went to full time, having a quick and easy labor. There was not much loss of blood at the end of the third stage. The effusion in the pleura was slow of absorption, and on the tenth day of the puerperium thoracentesis was done and about 1 litre of clear serous fluid withdrawn. There was some reaccumulation of the fluid, which gradually became absorbed in the course of several weeks. During this time the patient was very anæmic and considerably emaciated. A tubercular condition was suspected. At the end of the fifth puerperal week the uterus was still large, being the size of the gravid organ at the eighth week. Uterine massage was now employed for a couple of weeks, at the end of which time the uterus was slightly larger than the non-parous uterus. The patient had in the meantime gained considerable strength and was decidedly less anæmic.

Th. Hansen, in two cases of advanced pulmonary phthisis, also found tardy involution. In the one case the uterus measured 8.5 cm. at the end of the eighth week. Heschl (quoted by Hansen) had a similar experience in meeting with subinvolution in severe constitutional diseases. Of course, the writer does not lose sight of the fact that, in general, constitutional diseases, especially pulmonary phthisis and syphilis, are attended with uterine atrophy.[1] But their influence on post-puerperal involution must be decided by further investigation. The menses may reappear while lactation is still going on and in the presence of more or less atrophy. This occurred in nine of the cases recorded in the tables. Hence the re-establishment of the menstrual process cannot always be taken as a sign of the complete regeneration of the uterus; in other words, the growth of the mucous membrane does not necessarily go hand in hand with the growth of the muscular tissue. Kleinwächter met with some cases of even profuse menstruation in which the uterine atrophy was quite marked. In common with other observers, I have seen a number of instances in which conception had taken place during lactation without the intervention of the menstrual period.

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[1] The degree of uterine atrophy attending pulmonary tuberculosis is, in my opinion, generally overestimated. The amenorrhœa usually taken as an expression of this condition does not occur as an early symptom save in young girls with poor general development, in which it may safely be assumed there had been some arrest of uterine development. In examining several women, inmates of the Montefiore Home for Chronic Invalids, in reference to this point, it was learned that amenorrhœa occurred only when the disease was far advanced. Even in the third stage, with small and large cavities in both lungs, and very pronounced general anæmia, the uterus was found to be reduced in size only to a moderate degree. The minimum measurement of the depth of the uterine cavity obtained was 6.5 cm.

Case I.—A. H., aged twenty-eight years; married eleven years; six children; conceived while nursing the fifth child. Is now nursing the sixth child, which is ten months old. She is two months pregnant. Has not had a menstrual flow for four years.

Case II.—B. A., aged thirty years; married twelve years; six children; is nursing last child, which is seven months old. Has not had any menstrual flow for over sixteen months. Is now pregnant eight weeks.

Our views regarding the anatomico-pathological changes of involution must undergo a radical change in the light of more recent researches. We can no longer accept the teachings of Heschl and Kölliker that the muscle-fibres of the puerperal uterus completely disappear by a process of fatty degeneration, and that new muscle-fibres develop from without inward. M. Saenger has shown that fatty degeneration plays but an insignificant part in this truly mysterious process of nature. The result of his investigations was forestalled by Luschka, who in his work on anatomy expresses similar conclusions to those reached by Saenger. According to these two observers, a true atrophy of the individual muscle-fibres occurs. Saenger found the length of the muscle-fibre at the end of the fifth puerperal week to be 24.4 mm., while that of the normal uterus was 34.1 mm. The breadth of the muscle-fibre at the same period he found to be 6 mm., and that of the normal uterus 5.1 mm. The greater breadth, he says, is due to the fat-drops which swell out the individual muscle-fibre. He goes on to add " that the index of length of the fibres after complete involution is less than that of the normal uterus, harmonizes with the well-known fact that the entire uterus, especially in nursing-women, is often smaller than is normal; in other words, there is a physiological post-partum super-involution or atrophy of the uterus."

It would appear, therefore, that the function of lactation promotes this physiological process. How it does this receives various answers from different observers. Engström says that it does so by inducing a marked degree of general anæmia, and that the atrophy is due to the consequent local anæmia of the sexual organs. Gottschalk explains it by the frequent irritation of the nerves of the mammary glands which the act of nursing calls forth. This irritation of the mammary nerves acts reflexly upon the nerves of the uterus and pelvic organs, causing a contraction of the bloodvesels, and thus producing a local anæmia. Thorn expresses somewhat similar views, classing it under the category of reflex trophic neurosis. But if we are willing to accept Saenger's observations, it seems to me the explanation is a simpler one. We know positively from clinical observations, that the irritation of the mammary nerves by the act of nursing shortly after birth will reflexly cause contraction of the uterine muscular fibre. We must, therefore, be willing to grant that the same thing occurs later, though it is not so evident to us, because the uterus is no longer large and flabby and contractions of the organ are no longer palpable to our examining hand. That the muscle-fibres may be acted upon directly through the channel of the nerve-communications can be readily understood from Herff's researches.[1] They demonstrate that the greater part of the uterine nerves pass directly to the muscular tissue, forming in it by anastomosis a coarse network. From this network fibrils of moderate thickness arise, which divide up finally in the finest axis-cylinders. These are connected with the individual muscle-fibres in a peculiar manner, so that each axis-cylinder communicates with several muscle-cells before it ends in the terminal ganglion. It is reasonable to assume that the bloodvessels also take some part in the process, in accordance with the views of the author just quoted.

From that which has gone before it may be readily inferred in what light the writer regards the prognosis of lactation-atrophy. Being, in his opinion, a normal and physiological process, its occurrence is earnestly to be desired.[2] Certainly it may be carried too far, and permanent hyper-involution follow. But that this is a frequent contingency is contrary to his experience, which in this respect corresponds to that of Engström[3] and Thorn. During the past three years I must have seen in dispensary practice at least 200 cases of lactation-atrophy, and I can recall only two or three instances of permanent hyper-involution.

I met with one case in which the regeneration of the uterus was evidently very slow:

T. B., aged twenty years; married three and a half years; one child two years and three months ago; menstruated at thirteen years, and was regular from the outset. Has not menstruated since the birth of her child, twenty-seven months ago. Is now two months pregnant.

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[1] Über das anatomische Verhalten der Nerven im uterus und in den ovarien des Menschen (Münch. Med. Woch., 1892, No. 4).

Über den feineren Verlauf der Nerven im Eierstocke des Menschen (Zeit. für Gyn., Bd. xxiv. Heft 2).

[2] "After removal of all products of disintegration we still have remaining the same muscle-fibre which only goes through a kind of moulting process, in order to return to its previous, yes, to a more vigorous fulness, to its previous constant, but deliberate routine tissue-changes after it has reached the extreme degree of puerperal diminution which has reduced it to a size somewhat smaller than the normal muscular fibre of the uterus." (M. Saenger.)

[3] Engström out of 87 cases met with only 3 cases in which restitution had not occurred two or three years after labor. The women had nursed eleven, fourteen, and twenty-four months, respectively.

Other observers have seen similar cases. The question that now occurs to us is, Does post-puerperal hyper-involution ever take place independently of lactation? If we base our reply on the anatomico-pathological researches of M. Saenger already referred to, we must answer in the affirmative. I have but few data relative to the question:

Case I.—Mrs. A., a primipara, was delivered by me with forceps of a female child on July 27, 1895. The labor was tedious on account of rigidity of the soft parts.

There was a smart post-partum hemorrhage, which, however, was readily arrested by the usual means. An attempt to nurse the child was made, but had to be given up on the sixth day on account of absence of lacteal secretion. The puerperium was perfectly afebrile and smooth. In the fifth week her menses reappeared, and, as they were profuse and persisted for a longer period than usual, she was put to bed and given ergot. After the cessation of the flow the uterus was found to be considerably enlarged. Hence uterine massage was employed for the following two or three weeks, applying six *séances* in all. On September 19th the uterus bimanually was found to be smaller than the normal and with the sound gave a measurement of 6 cm.

Whether or not puerperal hyper-involution apart from lactation frequently occurs must be left to future investigation. To its non-occurrence, in my opinion, may be attributed many of the gynecological cases one sees in private practice. The history which everyone will readily recognize is usually as follows: The patient has had a normal labor and normal puerperium. At the second, third, or fourth week, the custom varying in accordance with the social standing of the parturient, the attendant physician has dismissed himself, saying that everything was all right. The woman says that she felt well for some months after labor, but that for the past few months she began to suffer from leucorrhœa, a sense of weight in the lower part of the abdomen, and with growing tired on the least exertion. There may be and there usually is backache and more or less of a dull pain extending down both thighs. On examination one finds redundant vaginal walls, a large uterus of flabby consistency, some leucorrhœal discharge, and abnormal mobility of the uterus owing to a lax condition of the pelvic tissues. The striking feature of these cases is the gradual onset; the patient can scarcely tell just when she began to have symptoms. This picture is most frequently met with among the better classes in whom lactation is the exception rather than the rule.

It is my firm conviction that this condition is the outcome of imperfect involution and could readily be avoided, if the attendant physician kept his patient under observation for at least three months after the puerperium. It is my custom at my last visit to request the parturient to present herself at my office for examination once a week or once every two weeks until at least the twelfth puerperal week. By observing this rule I have frequently been able to avert, by timely recognition, the ill consequences accompanying deficient involution.

It naturally follows that there is not anything to be said on the treatment of lactation-atrophy. A word or two, however, will not be amiss. The nursing-woman should be kept under constant surveillance ; an effort should be made to keep up good nutrition ; the period of lactation should not be allowed to be prolonged beyond a reasonable period. A watch should be kept that the normal hyper-involution does not become permanent from whatever cause it may.

*To summarize :* 1. Modern researches tend to prove that post-puerperal involution consists chiefly in a retraction and contraction of the individual muscle-fibres whereby the whole uterus is reduced in size.

2. When involution goes on to its full completion the uterus is reduced to a size smaller than that of the non-parous organ.

3. This condition of complete involution is known as post-puerperal hyper-involution. It is principally seen in nursing-women, and from this circumstance has received the cognomen of *lactation-atrophy.*

4. The so-called lactation-atrophy is a normal and desirable condition. It is temporary in its duration ; but very rarely under unfavorable circumstances may become permanent.

5. When the parturient is unable to perform the function of lactation it is the duty of the physician to endeavor to bring about hyper-involution by other means at his disposal. An observance of this course will prevent many a woman from developing a host of gynecological affections which frequently result from imperfect involution.

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# SCLERITIS.

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In this brief paper I have no intention to discuss the whole subject of inflammation of the sclerotic coat, but only to point out a few peculiar circumstances connected therewith from a strictly clinical point of view.

Scleritis is not a common disease, though probably among our highly rheumatic population in Scotland its occurrence is not so infrequent as it is in other places. And one would not expect that it should be common, for there is, I think, no tissue of the whole body whose function is, so far as we know, more purely mechanical and passive. Even a tendon has an active life compared with the sclerotic coat, whose sole duty it is to keep its shape, to maintain by its inherent rigidity the form and bulk of the globe. If it be true that the more active a tissue is, and the more the degree of its vascularity varies from time to time, the more apt is it to inflame, we can easily understand that the sclerotic is not a readily "inflammable" structure. It might be pointed out that the cornea, which is simply a non-vascular and transparent continuation of the sclerotic, and which has similar functions, is particularly liable to attacks of inflammation; but there are special circumstances in the case of the cornea, especially in regard to its nutrient supply, into which I must not now enter.

The persons liable to be affected with scleritis belong to two classes: (1) women either at the beginning or the close of their menstrual history, just on which occasions there is frequently a certain amount of irregularity of function; and (2) persons, whether men or women, who are of rheumatic family. I say "persons of rheumatic family" rather than "rheumatic persons," because, so far as my experience goes, I have found scleritis not so much among those who actually themselves suffer from declared rheumatism, as among those whose parents or other near relatives have so suffered. (Other causes, though decidedly less frequent, are gout and syphilis.) These two facts of liability—the menstrual and the rheumatic diathesis—seem to me to point in the direction of a chemical irritant cause, and so too do certain other facts in connection with scleritis, as we shall see.

Two portions of the sclerotic are liable to inflammation, and under ordinary circumstances two only, viz., that part close by the optic disk at or near the posterior pole, and the ciliary region anteriorly. Inflammation of the sclerotic in the first mentioned of these regions is really secondary to the involvement of the choroid in myopia, and has, as a matter of fact, little in common with the anterior scleritis of the ciliary district, therefore I dismiss it for the meantime. Turning our attention rather to the second variety, we can readily understand that at the ciliary region, where the coat is thinnest and most vascular, it should be particularly liable to inflame. Of this area two parts appear to be specially open to attack: these are (1) the part lying in a roughly triangular area bounded above and below by the margin of the upper and lower lids and internally by the outer limit of the cornea, this being the region most freely and most constantly exposed to the influences of air, cold, wind, dust, and sunshine; and (2) a portion at the upper limit of the vertical meridian of the cornea, the region which is most protected of all from these influences, which is never exposed to air, sunshine, wind, cold, or dust, which is never without the protection of the upper eyelid for a moment. These facts being so, for these two regions are by far the most frequently attacked, we cannot escape the conclusion that there must be some cause quite apart from climatic or exposure reasons for this vulnerability. I am inclined to look for this special determining cause in the vascular arrangement of the corneo-sclerotic junction, in the case of the upper district, and allow the climatic cause considerable weight in the case of the outer district. What seems to me almost to point to a vascular cause is the fact that when an interstitial keratitis becomes vascularized, it almost invariably does so from this upper area. The usual course of events in such cases is that vessels become massed together in the corneo-scleral junction at the summit of the corneal circle and slowly make their way into the substance of the cornea from above downward. After this has gone on for some time a similar process begins below, at the inferior limit of the vertical meridian of the cornea. The same is true of the very similar disease known as vascular keratitis, to which indeed some (mistakenly, as I think) deny a separate and individual existence. An analogous state of affairs is to be observed also in the development of that curious quasi-senile change in the cornea, the arcus senilis, which is first shown above, then begins to be manifest below, and slowly makes its way round the cornea from these two starting-points. I can recollect seeing only a very few cases of an arcus *commencing* laterally; I do not recall an instance of a well-marked salmon-patch in interstitial or vascular keratitis which developed in the lateral portions of the cornea before it had shown itself either above or below; and only a few instances where the salmon-patch was present at the lower before showing itself at the upper limit of the cornea. The precise explanation of these facts I do not pretend to be in a position to indicate, but that there is some reason, and that reason is probably connected with vascular supply and return, I cannot doubt.

The contrast in respect of this matter to the areas of liability of the light-transmitting and light-receiving media is very marked. Thus the first striæ of a cortical cataract are in a large majority of cases to be seen in the lower half-lens, and if one wishes to discover the patches of disseminated choroiditis, let him search the lower half of the choroid. The same is not true of the retina, for its diseases are mostly systemic in origin and general in distribution; nor is it true to the same extent in respect of the cornea, though even for it the statement is *partially* correct, for its nutrition is on a wholly different plan. The diseases of these "visual" regions are largely "light determined," and therefore the most illuminated area, the lower part, is most apt to suffer.

In respect, too, of its mode of onset and behavior scleritis presents certain special features. In the first place, I have never observed that exposure to cold was capable of causing it originally, though fresh attacks in a person who has once had it may probably be lighted up in this way; in this respect scleritis differs from many external and internal diseases of the eye (and other parts), even those which are distinctly systemic in origin. Scleritis, too, is unquestionably periodic in its recurrence; the intervals may not be very uniform in duration, it is true, but the waves of attack and relaxation are distinctly delineated. This is not more true, so far as I can judge, in women than it is in the male patients. A still more curious fact in regard to recurrence is that when a fresh attack occurs it takes place not in the part which was formerly affected, but in the nearest lying portion of sclerotic, so that if there are many recurrences the disease works its way right around the corneal circle to its starting-point again. In some skin diseases we see somewhat similar behavior, though not exactly the same; nothing precisely similar is found in any other part of the body.

Yet another peculiarity is that having occurred, recurred again and again, and having perhaps "circumnavigated" the cornea, scleritis ceases, and in a large proportion of cases never again troubles the patient.

In another particular scleritis resembles some other rheumatic affections of the eye, and as surely differs absolutely from certain others, viz., that it very often remains absolutely limited to one eye. That eye may be attacked again and again, may be irretrievably damaged by the repeated onsets, and yet the other remain perfectly sound, perfectly unaffected all the patient's life. On the other hand, we sometimes see the contrary condition, and both eyes attacked either at the same time or after an interval. I think it may be taken as a rule that the milder cases are limited to one eye even though they recur again and again, but the severer cases, those more properly described as sclero-cyclitis, attack both eyes, even though there may be very few recrudescences. To this rule, however, exceptions are not rare.

The superficial varieties of scleritis are of slight importance, speaking comparatively; but when the inflammation proceeds deeper and involves the entire thickness of the coat, and still more when underlying structures are involved, the results may be extremely serious. In the cases in which the inflammatory changes are limited to the sclerotic the chief dangers are opacity of the cornea and ciliary staphyloma, and a minor evil is the occurrence of myopia. The resulting opacity of the cornea may be present centrally—from interference at the ciliary circle with the proper nutrition of the cornea, I presume—or peripherally, in which case it assumes the character of a sclerotizing keratitis. This name is very ill-applied, but the result of the change is that the peripheral portions of the cornea become altered into a white opaque tissue, quite unlike normal cornea. But neither does this altered corneal tissue accurately resemble normal sclerotic, for it is whiter, more like glazed porcelain, more "dead" looking than the sclera. The occurrence of this sclerotizing change imparts a curious eaten-into appearance to the corneal margin, very characteristic of the course of events. Naturally, since scleritis itself affects these regions chiefly, this alteration in the cornea is most to be found at the upper and outer portions of the cornea, though it is often to be seen all the way round, because in the case in which this is produced the whole circumference of the sclerotic has usually been attacked by inflammation. The other danger, viz., ciliary staphyloma, is to be feared in those cases in which the inflammatory change in the sclerotic is followed by atrophy of its tissue. In many cases after the redness has passed off the bluish-violet color of the ciliary body may be seen shining through the thinned sclera, but where this change is exaggerated and the weakest coats yield to the internal pressure—which is itself perhaps unduly increased—then there is formed a slight bulging just outside the margin of the cornea. Gradually this increases until in bad cases there comes to be formed at the upper part of the circumference or all round the cornea, it may be, a large blue staphyloma veined with white lines, the remains of the sclerotic fibres, resembling—according to the older authors, who saw poetic resemblance in many things — a bunch of grapes.

But when the inflammation passes more deeply and involves the outer coats of the eye we have a train of events most disastrous in their results. The first tissue to suffer is, as a matter of course, the ciliary body itself. The consequence of this is grave interference with the nutrition of the two immensely important structures, the vitreous humor and the crystalline lens. This follows of necessity, for, as has been shown by Collins and others, the ciliary body is partly composed of an infinite number of glands whose function is to preside over the nutrition of these transparent media; dimness and haziness of the aqueous humor, then cloudiness and intransparency of the vitreous humor more or less dense and more or less widespread, and gradually increasing cataract of an unhealthy type, are the direct sequelæ of degeneration of the ciliary body. At the same time the tension of the globe, often increased at first, tends to become lowered, and the retina to become detached from the choroid. The ciliary body being continuous with the choroid coat behind and with the iris in front, inflammatory changes are very apt to spread to these structures, and we have next brought about the further evils produced by choroiditis of a sluggish and degenerative character. Iritis shows itself in the "bound-down" pupil, in the lymph exuded into the pupillary area of the anterior lens capsule, in the iris bombé, and in the surely degenerative vision.

The consequences of a bad case of deep scleritis are thus seen to manifest themselves in the disease and degeneration of every "vital" part and organ contained within the globe.

In respect also of the treatment appropriate to the condition, scleritis presents a peculiarity, for, speaking generally, the less local treatment is employed the better. Personally, I seldom enjoin any local application beyond bathing with a warm or lukewarm bland lotion. In more sluggish cases massage with a mild mercurial ointment seems to do good, but should be used with caution. Atropin is only useful where complication exists in the way of inflammation of iris or ciliary body, and, in view of the possibility of the tension rising and the weakened coats yielding, the effect of the atropin also must be anxiously watched, and a myotic substituted if necessary. Some have obtained benefit from subconjunctival injection of mercurial lotions, and even of water; I have, in a few cases in which the vascular injection and the swelling were persistent and severe, obtained good from the operation of periotomy either locally or all round the cornea. But it is really on internal medication that reliance has to be placed, local treatment being quite secondary in importance and value except perhaps as applied to the complication. It is not necessary in this article to mention all the remedies which are employed, and to do so would take me outside the intended lines of this article, but I should like to direct attention to a mode of treatment which has not obtained the place in the estimation of the profession to which I think it is entitled, viz., subcutaneous injection of pilocarpin. The method of carrying this out which I prefer is to let the patient have a walk in the fresh air in the morning; dine lightly on fish or chicken with vegetables, but no meat, about one o'clock; to retire to bed, lying in flannel, at about 4 P.M., which time I administer an injection into the arm of about one-tenth to one-sixth of a grain, according to what I find the patient can well stand. The patient remains in bed for three to four hours, perspiring, and then cooling down, during which time a cup of tea is allowed; then the patient is permitted to get up, takes a slight warm bath, changes the clothes entirely, and may stay up in a warm room for a few hours; he takes a light milk supper, and according to circumstances sleeps in a different bed, or at all events in thoroughly dry bedding. I do not claim in the least to have myself discovered the virtues of pilocarpin in such cases—it is mentioned in Landolt and de

Wecker's *Traité d'Ophthalmologie*, and elsewhere—but I do think it is deserving of more attention than it receives at present in the treatment of obstinate cases of scleritis.

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# THE CAUSES OF THE LOCALIZATION OF GUMMATA.

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Among the many problems which are encountered in theoretical medicine few are of more interest than those dealing with the question, "Why in any general disease is a special part of the body affected?" and in this paper I shall endeavor to answer, in part at least, this question as applied to gummata; that is to say, "Why do gummata, the local manifestations of a general condition, occur in the body in those positions in which they are found rather than elsewhere?"

And first, as to the etiology of gummata. There can be no doubt that the primary lesion in syphilis is the effect of the local action of the specific organism at the point of inoculation, and that the secondary manifestations are similarly the effects of the organism and its chemical products on the body generally after the microbe has entered the bloodstream; the contagiousness of the primary and secondary lesions is sufficient proof of this proposition. But when we proceed to the tertiary lesions, we are justified in considering that the existence of the organism in the body at the time of their appearance is not necessary, as when they appear usually the case is no longer infective, that is to say, the organism is dead. Occasionally tertiary lesions have appeared to be infective, but these cases are probably to be explained by the coexistence of secondary eruptions; so that we may, I think, accept it as fairly certain that tertiary manifestations may exist without the organism. Before its death the organism has formed a large quantity of chemical substances, "toxins," which it leaves behind, and the production of which probably hastens its death. These products which are doubtlessly chemical in nature, and probably organic, though not organized, have the power under certain circumstances, of acting as an irritant of a special kind on some of the tissues, and so giving rise to a gumma. The structure of a gumma shows that, though different in many respects from ordinary inflammatory tissue, it is still merely a product of inflammation. In the centre we find (before caseation has set in) giant cells, surrounded by masses of small "lymphoid" cells. The irritant is not a mere mechanical irritant, but a special chemical substance, and that fact naturally suffices to distinguish its product from those of other irritants of a more simple nature. A giant cell, at least in most cases, may be looked upon as the result of an irritant acting on a normal cell, the irritant being not sufficiently powerful to cause the cell-substance to divide, but intense enough to cause the nucleus to multiply. The giant cells of a gumma, then, are probably derived from exudation corpuscles, which have become giant cells by the action of the irritating toxins of the syphilitic germ.

It is often stated that the tertiary manifestations of syphilis are due merely to a general chronic inflammatory condition of the whole body, caused by the action of the syphilitic virus, but the cause having been removed, the inflammation would tend to subside rapidly and would certainly not persist for years, sometimes for ten, twenty, or even for thirty years, as we find it does.

We may, I think, accept the theory that a gumma is the result of a special irritant acting on the tissues, and we now have to determine why a gumma appears in one place and not in another.

The first proposition I would lay down would be that " gummata tend to appear in structures poorly supplied with blood." Thus, let us consider the case of the tongue; the least vascular part of the tongue is the median vertical septum; this is well shown by the fact that if the tongue be divided with the scissors in the middle line, as is done in excision of half of the tongue, practically no hemorrhage occurs. This is the part of the tongue where we most frequently meet with gummata; in fact, they are very rare in any other part of the organ. But though the whole median lingual septum is nearly vascular, yet there is one part of it which is especially free from vessels, namely, a line, parallel to the dorsum of the tongue and about one-quarter of an inch below it; and this is decidedly the most frequent situation for gummata of the whole tongue. And we find the fact to be the same for other organs; when a gumma is deposited in muscular parts of the body, it is nearly always situated not in the muscular substance itself, but in intermuscular septa or in the sheaths of the muscles.

In bone also (putting aside the cases in which the formation of a gumma follows an injury, which I will consider later) gummata rarely occur in cancellous tissue, but are not uncommon in compact bone, as in the cranial bones. In the liver gummata rarely occur if the liver be otherwise healthy, but they are very prone to occur in cases in which the liver has previously been the seat of a general syphilitic sclerosis. When the laryngeal cartilages are affected the gummata are deposited in the fibrous perichondrium. When joints are involved the gummatous deposit affects the capsule. These incidents are sufficient to show the tendency that the gumma has to affect avascular parts of the body, and it is equally evident that it does not attack parts that are remarkable for a large amount of blood-supply. Thus, gummata of the lungs are very rare, but they may occur if there has been a previous chronic fibrous or fibroid pneumonia. The spleen, pancreas, and kidney are rarely affected with gummata, and all are very vascular organs. This tendency of gummata to appear in avascular tissues shows a marked contrast to what is met with in the case of tubercle, for tuberculous masses, though histologically extremely like gummata, are only deposited in vascular tissues; this is seen in the frequency with which the lungs are affected with tubercle.

The second proposition I advance is that "impairment of the nutrition of any tissue is a great incentive to the deposition of gummatous material in it." The impairment may be the result of either of two classes of causes, namely, of injury or of interference with the circulation.

That local injury predisposes to the formation of a gumma accounts for the frequency with which we meet with the statement that a blow or some such injury has preceded the appearance of a swelling, which proves to be a gumma. The following is a fairly typical example:

A woman, aged forty-five years, received a blow on the left leg, immediately above the internal malleolus; about a month later she applied at the hospital on account of a very definite swelling on the tibia where the blow had been inflicted; it was about three inches long, and at its greatest elevation it was raised about one-half inch above the general level of the bone; its edges were well defined. Though a little doubt was felt as to its nature, yet, as a slight syphilitic history was obtainable, the case was treated by the internal administration of potassium iodide, and the swelling rapidly disappeared.

The frequency with which syphilitic nodes appear on the crest of the tibia is sufficient evidence in itself that local injury is a powerful exciting cause for the appearance of a gumma.

Sometimes the injury has been so slight that at first reasonable doubt may be felt whether it has been sufficiently severe, but I think enough cases could be quoted to show that the injury, slight though it be, has been the localizing cause. In many cases an injury, though slight, if often repeated, will suffice to cause the appearance of a gumma; such are the cases in which gummata appear in the skin over the knee; this position is much more common in women than in men, and even in women it is practically confined to those who have much kneeling to do, as in floor-scrubbing. Again, excessive use of a joint, or even an amount of use which can hardly be called excessive, will suffice to localize a gumma; thus a by no means rare situation for a gummatous deposit is the sterno-clavicular articulation; I am not aware of any post-mortem examination having been performed on such a case, so we cannot be certain in what structure of the joint the deposit occurs, but in all probability the capsule is the part affected. Now, in these cases the right sterno-clavicular joint is the one which is almost always attacked, the joint on the left side being affected very much more rarely, the obvious explanation is that as most people are right-handed the right sterno-clavicular joint is much more used than the left. In one case in which the joint on the left side was affected, the patient, a woman, volunteered the information that in her work she had to use the left arm much more forcibly than the right. Speaking generally, we may say that, whenever gummata are met with in connection with a joint, evidence can be obtained that the joint in question has been used more energetically or more frequently than other joints.

I have mentioned already that impairment of the nutrition of a part may be due to interference with the circulation, as well as to injury. A very good example of this is to be found in the frequency of the occurrence of gummatous ulcers on legs in which the veins are varicose. In these cases at first sight there may seem to be an excess of blood, but the stagnant blood of the passive congestion caused by varicose veins is of little avail for purposes of nutrition; in fact, the nutrition of the part is much impaired and gummata are readily deposited, especially where the congestion is greatest—that is, in the lower part of the leg. Many ulcers appearing in this situation and being accompanied by varicose veins are often diagnosed as ' varicose ulcers," and resist long-continued treatment, but yield readily if antisyphilitic treatment be combined with the treatment directed against the varicose condition.

I may briefly recapitulate the propositions I advance as to the causes of the localization of gummata:

1. That a small blood-supply is necessary for a part to become the seat of a gummatous deposit.

2. That anything which impairs the vitality of a part will predispose that part to invasion of a gumma; and that mechanical injury, excessive use, and interference with the circulation are the chief ways in which this impairment of vitality is brought about.

# REVIEWS.

The Pathology and Treatment of Venereal Diseases. By Robert W. Taylor, M.D. With 230 illustrations and 7 colored plates. New York and Philadelphia: Lea Bros. & Co., 1895.

This book is decidedly the most important authoritative treatise on venereal diseases that has in recent years appeared in the English language. It represents not only the beliefs and teachings of its distinguished author, but it has embodied in the text the result of the studies and conclusions "of all observers whose work shows inherent evidence of truth and progress." It is particularly noteworthy for the attention which has been devoted to pathology in relation to its practical applications.

After a brief but very clear description of the anatomy and physiology of the penis, the urethra, the bladder, the prostate and accessory parts, the study of the gonococcus is taken up. As a conclusion the author states:

"The consensus of opinion of the most eminent investigators of this subject is that from cultures alone can we get absolutely correct knowledge of the character and identity of micro-organisms. In this way the gonococcus can be demonstrated without any trouble, and confirmation of its existence may be obtained (if a consenting case can be found) in experimental inoculations on the male or female urethra. It must be borne in mind that the mucous membranes of most animals are immune to the virulent actions of the gonococcus, but the urethra of the dog can be infected with cultures made in an acid medium."

Considering the etiology of gonorrhœa, Taylor draws the following conclusions:

"1. In a large proportion—perhaps in a large majority—of cases of acute purulent gonorrhœa or urethritis the pathogenic agent is the gonococcus. (Bumm, it will be remembered (*vide supra*), claims that in every case it is found.)

"2. In a small proportion of cases of acute purulent gonorrhœa or urethritis the infecting agent or agents seem to be, in the absence of the gonococcus, one or more of the pyogenic microbes, the staphylococcus and the streptococcus, and perhaps others whose virulency is not yet demonstrated. (Bumm claims that secretions free from gonococci are non-infectious.)

"3. In many cases of mild urethritis in virgin subjects, and in those who had no true gonorrhœa some time before, these micro-organisms and others more or less well known to us are in all probability the causes of urethral suppuration, the tissues being rendered by coitus favorable to their pathogenic action.

"4. Some cases of mild or more severe relapsing gonorrhœa, with abundant purulent secretion, may be due to the renewed activity of gonococci, which may have remained latent and dormant in the urethra, but which, under favoring circumstances, had again taken on their virulent action. In some of these cases the symptoms are much less severe than in the first attack. The inference, then, is that the tissues are less susceptible or that the virulence of the gonococcus has become attenuated.

"5. Many cases of more or less severe relapse after true gonorrhœa are not due to the gonococcus, but to other less virulent microbes. Then, again, the hyperæmia left after an attack of gonorrhœa may increase to an active purulent inflammation as a result of stimulation or sexual excesses, microbic action being entirely absent. This is probably the condition in most cases of acute or mild urethritis in which neither gonococci nor other micro-organisms are to be found.

"6. It is clearly proved by clinical observation and experimental inoculation that pus or any secretion (*e. g.*, the lochia) containing gonococci may, and does, produce a virulent suppuration in susceptible mucous membranes, most commonly of the urethra and of the eyes.

"7. The observations of Lustgarten and Mannaberg, of Steinschneider and Galewsky, and of others already mentioned, go to show that pathogenic and non-pathogenic micro-organisms are found as inoffensive inhabitants of the normal urethra. There is sufficient evidence in our possession to-day to warrant the belief that under the favoring conditions of sexual excitement and excess these micro-organisms become hostile and virulent and give rise to urethral suppurations of both mild and severe types.

"8. The statement is further warranted that these saprophytic agents may cause a purulent inflammation in a urethra congested, ulcerated, or infiltrated as a result of a previous gonococcus inflammation. There is no doubt whatever that many cases of relapse of gonorrhœa are not caused by a renewed gonococcus-infection nor by the relighting into activity of latent hibernating gonococci, but that they are due to the morbid action of the less virulent microbes, denizens of both healthy and damaged urethræ.

"9. The advocates of the gonococcus theory go too far when they claim that this micro-organism so frequently remains dormant and hiding in the urethra after the cessation of a true gonorrhœa. The gonococcus is essentially a virulent agent and a disturber of the peace, and for reasons and from facts to be given later it is fair to assume that it disappears from the urethra upon the final cure of true gonorrhœa. It is the exception, rather than the rule, that it should remain dormant in the urethra for a long time.

"10. Most of the cases of gonorrhœa or urethritis which are the result of chemical or mechanical irritation or violence are in all probability due to the morbific action of a number of micro-organisms so constantly found in normal and chronically and very subacutely inflamed urethræ. This statement is very clearly proved by the evidence of Legrain, De Amicis, Castex, myself, and others. In some cases these chemical and mechanical irritants provoke an exacerbation of the virulence of the gonococcus. In these cases, however, it is probable that the virulent urethritis is not yet at an end, or that the gonococcus had not yet thoroughly disappeared.

"11. The studies of Eraud, Hugounenq, and D'Arlhac are worthy of thought and investigation, since they put the gonococcus question in a new light. They think that this micro-organism is a denizen of the normal and diseased urethra, and that under favorable conditions it takes on virulent action. It will be seen a little further on that it is frequently very difficult, and in many cases impossible, to find gonococci in the secretions of a woman with whom a man suffering from true gonorrhœa has had coitus. Many cases seem to prove that the infection of the man (he even having a healthy urethra) is due to causes inherent in himself. Neisser and his followers in a magisterial manner claim that gonococcus-infection in the male urethra in a virgin subject always is derived from a secretion of the female consort containing gonococci. We shall see, later on, that this view is at variance in many cases with clinical facts, and that Eraud's proposition may in the end lead to a partial or full explanation of the subject. There are, however, very many cases (as we have seen) of gonorrhœa which were derived from a similar process in the female.

"12. The term 'pseudo-gonococci' does not apply to any particular micro-organism, but it is being applied rather loosely to any and all microbes capable of producing urethral suppuration."

In the treatment of acute urethritis or gonorrhœa it is worthy of remark that decided preference is given to a very admirably devised conservative plan in accordance with which injections are not begun until the extreme severity of the acute stage is moderating. Detailed observations of irrigations, retrojections, and endoscopic applications as abortive measures receive due consideration.

It is interesting to note that in chronic urethritis preference is expressed for the bougie a boule as an exploring instrument.

The complications of gonorrhœa are very fully considered, and chapters are devoted to Gonorrhœa in the Female, Gonorrhœa in Boys, and Gonorrhœa and Vulvo-vaginitis in Infants and Young Children. Under Stricture of the Urethra it is gratifying to learn that Taylor lends the weight of his authority to a thoroughly conservative treatment; *i. e*, intermittent dilatation, advocating the use of the knife at least in deep strictures only when the safer and more gentle treatment is obviously inappropriate.

In the treatment of varicocele the operation of excision is evidently the one of choice. As a cure for hydrocele Taylor prefers incision, rejecting injection as only applicable to cases of rather recent hydrocele and of not excessive size, in which the epididymis and testes are healthy.

After a most logical discussion of the nature of chancroid, Taylor concludes as follows:

"What we call chancroid is the product of many varieties of pus derived from non-syphilitic and syphilitic subjects. It is, therefore, a hybrid, heterogeneous lesion, in all cases a septic ulcer, and in many instances simply an active form of wound-infection. This septic ulcer in some cases originates *de novo* from the contact of pyogenic microbes with a raw surface, herpetic or eczematous excoriation, a chafe, etc., sexual contact, local infective process, is more active in syphilitic than in non-syphilitic subjects. It follows, therefore, that so long as pyogenic microbes and tissue-predisposition exist chancroids will be found upon the mucous membranes and integument of the human race."

Under Treatment the following golden rules are given:

"In the treatment of chancroid it is important to know what not to do, namely, not to give mercury and treat the case as one of syphilis, which is the custom of many practitioners; not to employ the curette as an abortive or curative means in the very early stage of the ulceration; not to cauterize injudiciously and indiscriminately; not to use ointments and fatty preparations; and never resort to excision. Nothing but harm can follow any of these procedures."

The section upon Syphilis is truly admirable and occupies nearly half the book. It is probably the most scholarly, able, and practical treatise on the subject to be found in any language. In discussing the general methodical treatment of syphilis the following opinions are well worthy of quotation:

"I have carefully studied this question for more than twenty-five years, and I am now more than ever convinced that it is by far the best plan in most cases to wait until the onset of the secondary stage before we begin a mercurial course. In thus waiting it must be remembered that we are not to fold our arms and do nothing; we must regularly examine our patient; we must look after his general well-being, mental and physical, encourage him with hopeful prospects, and prepare him for his coming ordeal, the crucial one perhaps of his life. Then, just as soon as general symptoms and manifestations begin to appear, and we know that we are right and appreciate fully what we have got to treat, then we must begin our mercurial treatment with vigor, tempered by watchful care of our patient, and an enlightened and conservative knowledge of therapeutics.

"The treatment of syphilis means on the part of the physician a full knowledge of the disease, a consideration of the patient's strength or weakness, a close familiarity with the lesions and with the workings of the syphilitic virus in his system, and an accurate knowledge, based upon frequent observation and interrogation, of the manner in which the remedial agent affects his system and the general morbid condition. In other words, the physician has not the abstract problem—syphilis—to treat, but he has a human being infected with a chronic multiform disease as the subject of his study, and for whose relief and cure he must familiarize himself with his constitution and watch and guide the effect of his therapeutic agent."

It is to be hoped for the good of suffering thousands that Taylor's book will have in the profession the circulation and the careful study which it merits. E. M.

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The Principles and Practice of Medicine. Designed for the Use of Practitioners and Students of Medicine. By William Osler, M.D., Fellow of the Royal College of Physicians, London; Professor of Medicine in the Johns Hopkins University and Physician-in-chief to the Johns Hopkins Hospital, Baltimore, etc. Second edition. 8vo., pp. 1143. New York: D. Appleton & Co., 1896.

Although one of the most recent text-books, Osler's *Practice* has established itself as an authority, and the second edition calls for little in the way of general critical comment. The characteristics of thoroughness, clearness, accuracy, and frankness which mark all of the author's work are here pre-eminent, and, having lost none of their charm, are worth pointing out once more. The work is eminently a personal one —by which we do not mean to imply that the author is unfamiliar with the writings of others, or that he fails to utilize, and utilize well, the whole field of medical literature, but that he has based his descriptions and advice most largely upon personal observation and research, and is not a mere compiler, repeating errors and wisdom, ancient or modern, indiscriminately. While at times this personal limitation leads to an inadequate presentation of the subject of treatment, it adds to the weight of all positive recommendations. The personal element is not, however, always a limitation; thus it gives to the book what are, perhaps, its greatest merits, not only in imparting information, but in stimulating thought; namely, the direct relations established between pathology and semeiology, and the broad general views, not so much expressed in citable paragraphs and sentences, as impressed upon every theme and every page.

Dr. Osler's style is direct, forcible, simple, and the work throughout exhibits a due sense of proportion. There is, moreover, a sanity of judgment as helpful as it is rare. The new edition has been thoroughly revised and contains many important additions representative of the progress of medical science in the three years that have elapsed since the publication of the first edition. Some minor omissions have, however, been noted, and a few of these will be pointed out.

The article on Typhoid Fever has been thoroughly revised to date; and one notes as its most striking features the stress which the author now lays upon hydro-therapeutic treatment according to the strict method of Brand. As Dr. Osler has been slow to accept the Brand method in all its rigorous detail, his present opinion must be taken as a conclusion forced upon him by experience, and is, therefore, the more forcible. We regret, however, that he does not seem to appreciate either the philosophy or the practical benefit of what he terms "eliminative and antiseptic treatment." We feel convinced that if he will add to the hydro-therapeutic measures (not necessarily Brand's rigorous method) adapted to the individual case and the varying conditions present at different times, the use of such drugs as calomel, turpentine, salol, guaiacol, benzonaphtol, dilute hydrochloric acid, chosen also with regard to the special conditions present at the time of their administration, the mortality of his cases will be still further lowered and the comfort of his patients considerably increased. In cases of intestinal hemorrhage the use of plumbic acetate and opium is recommended, with ice internally, but the author has nothing to say concerning enemata of ice water and the application of ice to the abdomen, both of which are highly useful. We attribute to turpentine, too, a greater usefulness than he seems willing to admit. Besides restricting the amount of food we deem it important to change the character of the diet, giving only peptones or other food that can be absorbed directly from the stomach or upper intestine. In cases of perforation with peritonitis Osler is willing to "discuss the question" of cœliotomy. This is a judicious position. The article on Malarial Fever has been in large part rewritten and is probably the most complete epitome of the subject to be found in literature. We are glad to see that Dr. Osler recognizes the utility of quinine-and-urea hydrochlorate, for the more extended use of which we have long been contending. The section upon Diphtheria has been entirely recast and extended from eleven to twenty pages. We note with pleasure the adoption of the term "diphtheroid" to characterize those forms of membranous sore-throat in which the Klebs-Loeffler bacillus is not present, as well as the recognition of the fact that the presence of this microbe is not necessarily an indication that the person in whose throat it has been found is affected with diphtheria. The description of the diphtheroid throats, however, is quite imperfect and might have been bettered by reference to monographs or special text-books by American authors readily available. Dr. Osler recognizes the existence of a membranous laryngitis which is not diphtheria—a point which illustrates how in the revolutions of professional opinion the testimony of experienced clinicians is not to be lightly set aside because of imperfect pathological studies. The advanced pathology justifies, at last, those physicians who, in opposition to pathological authorities, contended that they did meet at the bedside with cases of membranous croup which were not of diphtheric origin. It is true that these cases are rare and that the discrimination is often difficult, and, in consequnce, proper precaution against the spread of infection should be taken in every case, no matter what the diagnosis may be. Without deciding finally, Osler expresses himself favorably toward treatment by antitoxin.

The articles on Septicæmia and Pyæmia have been rearranged and largely rewritten. In connection with the articles on Cholera, Syphilis, Tuberculosis, and other of the infectious diseases, much new matter has been added. Enteroclysis and hypodermoclysis are advised in the treatment of cholera, their usefulness having been established in the recent epidemics. More stress should be laid upon the application of external heat, and a few additional lines as to the methods of making such applications would not be superfluous. Dr. Osler is in favor of placing tuberculosis on the list of diseases of which notice must be given to authorities. He believes that the hardships entailed on individuals would be trifling in comparison with the public good that would follow systematic measures of inspection and disinfection.

While the author recognizes the fact that natural or spontaneous healing is frequent in tuberculosis, and that the first and most important measure in treatment is to place the patient in surroundings most favorable to the maintenance of maximum nutrition, and while for this purpose he properly emphasizes the value of fresh air, we regret, on the other hand, his imperfect estimate of the utility of altitude in climatic treatment and his very casual mention of pneumatic therapy in general. We have no hesitation in reaffirming here our opinion that any physician who at this period in the history of medicine neglects to give his phthisical patients the benefit to be derived from the persistent and intelligent use of air at modified pressures is extremely derelict.

Rheumatic fever is described as depending upon an unknown infective agent. We are inclined to believe that this statement might have been extended either by saying that there are many affections now wrongly included under the head of rheumatism which will hereafter be separated, or by saying that many unknown infective agents are causative of rheumatism. Arthritis deformans is still attributed to neurotrophic causes, an opinion which may, perhaps, have to be modified in a later edition. The causation is probably complex, infection and nervous influences both taking part in it; while there seems to be good reason for including impairment or perversion of thyroid function as an etiological factor in some instances. The sections on Gout and Diabetes have been considerably extended. Concerning the causation of gout we can all agree with Osler's statement that "the precise nature of the disturbance in metabolism is not known. There is, probably, defective oxidation of food-stuffs combined with imperfect elimination of waste-products." Of diabetes mellitus it is also frankly stated that "we are ignorant of the nature of the disease;" while reference is made, of course, to the various theories held by writers. As to the treatment of this group of affections, we are glad to notice that Dr. Osler believes it is better to allow the diabetic patient a few ounces of ordinary bread daily than to torture him with gluten bread and other unsatisfactory and often fraudulent substitutes. He recognizes the usefulness of levulose, but we are sorry to note the absence of reference to strontium preparations, which we believe to be truly helpful in the management of diabetics, especially the obese, the elderly, and the gouty.

Descriptions of infantile scurvy and of hemorrhagic diseases of the newborn have been added to the section on Constitutional Diseases. In the treatment of hæmophilia, calcium chloride, probably the best of all medicinal agents, is not mentioned.

In the section upon Diseases of the Digestive Organs descriptions of eczema of the tongue and of leucoplakia buccalis have been incorporated; but we miss any allusion to hairy tongue (black tongue), a condition not so rare as it was at one time supposed to be, and worthy of at least two or three lines in a modern text-book of medicine. The same may be said of herpes pharyngis and mycosis tonsillaris. In describing suppurative tonsillitis the author fails to call attention to the fact that the abscess is most frequently situated not in the gland itself, but in the connective tissue around the gland (peritonsillar abscess), and that in such cases the pus is to be reached most readily by incision through the swollen soft palate, a little to the inside of the upper angle of the gland. The use of guaiacol locally, probably the most effective measure now at our command in tonsillar inflammations, is not mentioned. In connection with the subject of adenoid vegetations at the vault of the pharynx we note with pleasure the allusion to Catlin's entertaining booklet.

The methods of clinical examination of the stomach have been omitted from the present edition of Osler's *Practice*, since they more correctly belong to the manuals of diagnosis; but the omission is more than compensated by additions to the chapters dealing with Appendicitis and Diseases of the Liver.

In relation to recovery without surgical interference in cases of appendicitis, Osler does not agree with those surgeons who assert that all such patients are liable to recurrence with grave accidents. He has known personally numbers of such cases in which after one or even two attacks the individuals have remained in perfect health. He calls attention, likewise, to the appendicular hypochondriasis which has been caused "through the pernicious influence of the daily press," and, he might have added, of those surgeons who are careful to have their operations accidentally reported in the daily press. The use of saline purges early in the attack, which is advocated by some surgeons, is, according to the author, a most injurious practice; on the other hand, he believes that opium could be given less frequently and that medicinal treatment should largely consist of regulation of the diet, rest, the application of ice externally, and a judicious expectancy ready to call the surgeon to operate, if by the third day the features of the case point to a progressive lesion.

The section upon Diseases of the Blood and Ductless Glands has been largely rewritten, retaining, however, its characteristics of clearness and fulness. Allusion is made, in connection with Addison's disease, exophthalmic goitre, and myxœdema, to the new methods of organotherapy. The author seems to give a qualified assent to the doctrine of the thyroidean origin of Graves's disease and its treatment by thyroidectomy—erroneously, we believe.

A new introduction has been written to the subject of Diseases of the Nervous System and useful diagrams added. Most of the important advances which have been made in the pathology and diagnosis of nervous diseases have been incorporated in the appropriate places. Paralysis agitans is regarded as a premature senility of certain regions of the cerebral cortex, and the microbic or infective origin of chorea, while alluded to with some degree of favor, does not seem to be accepted.

Changes and additions, besides those specially noted, are a new section on Affections of the Mesentery, a description of the dislocations and deformities of the liver, a brief account of anuria, and of the parasitic infusoria. There is no section which has not been revised and corrected and many have been entirely rearranged. As a whole, Osler's *Practice* in its improved form is probably the best and most trustworthy guide for the English-reading student. Beyond this, moreover, it is a satisfactory and helpful reference-book for the experienced physician, setting forth as it does the advanced position of contemporary science, while avoiding all temporary " fads " or fascinating but unproved speculations. Like its author, the book may be expected to retain permanently a high place in the esteem and affection of the profession. S. S C.

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A TEXT-BOOK UPON THE PATHOGENIC BACTERIA, FOR STUDENTS OF MEDICINE AND PHYSICIANS By JOSEPH MCFARLAND, M.D , Demonstrator of Pathological Histology and Lecturer on Bacteriology in the Medical Department of the University of Pennsylvania, etc. With 113 illustrations. Philadelphia: W. B. Saunders, 1896.

THIS volume of 359 pages presents in a systematic description accounts of all the important pathogenic bacteria, together with some of the non-pathogenic that resemble certain ones of the first class.

The substance of the volume is not new, it is only a different presentation of the facts of a great science, and this in the briefest possible way.

The book may very well serve as an introduction to the study of medical bacteriology. It is divided into the introductory portion containing a short history of the development of our knowledge upon the subject and a description of the methods of study of bacteria, and this is followed by the consideration of a number of special diseases and the bacteria related to them.

The volume is well printed, and the illustrations, which are mostly taken from other sources, are satisfactorily reproduced. H. C. E.

THE PRINCIPLES OF BACTERIOLOGY. A PRACTICAL MANUAL FOR STUDENTS AND PHYSICIANS. By A. C. ABBOTT, M D., First Assistant, Laboratory of Hygiene, University of Pennsylvania, Philadelphia. Third edition, enlarged and thoroughly revised, with 98 illustrations, of which 17 are colored. Philadelphia and New York: Lea Bros. & Co., 1895.

THIS well-known book upon bacteriology has come before the public for the third time, presenting some changes and additions which enhance its value as an aid in the laboratory. So much has been said in its favor before that there is little to add, but it may be well to emphasize the excellence of the descriptions of methods used by the author. The demand for the new edition is, of course, accounted for by the fact that the book supplies a marked need of the medical students of the country.

H. C. E.

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THE JOURNAL OF EXPERIMENTAL MEDICINE. Edited by WILLIAM H. WELCH, M.D., Baltimore. Associate Editors—*For Physiology:* H. P. BOWDITCH, M.D., Boston; R. H. CHITTENDEN, Ph.D., New Haven; W. H. HOWELL, M.D., Ph.D., Baltimore. *For Pathology:* J. GEORGE ADAMI, M.D., Montreal; W. T. COUNCILMAN, M.D., Boston; T. MITCHELL PRUDDEN, M.D., New York. *For Pharmacology:* JOHN J. ABEL, M.D., Baltimore; ARTHUR R. CUSHING, M.D., Ann Arbor; H. C. WOOD, M.D., Philadelphia. *For Medicine:* R. H. FITZ, M.D., Boston; WILLIAM OSLER, M.D., F.R.C.P., Baltimore; WILLIAM PEPPER, M.D., Philadelphia. New York: D. Appleton & Co.

IT is with much pleasure that we call the attention of our readers to the first number of the *Journal of Experimental Medicine*, for we believe that its appearance marks the development of a new era in American medicine. In this country the struggle for existence has been so absorbing and the opportunity for truly scientific medical work so meagre that the energies of our medical men have been devoted for the most part to those departments of medical investigation which promised some immediate practical return, and in consequence the bulk of our medical literature has consisted of reports of clinical studies and of therapeutic suggestions. The past decade has, however, witnessed a great change. Laboratories of experimental research have rapidly sprung up all over the country as the result of a wider appreciation of their need, aided in many instances by generous endowments, and the development of the more purely scientific departments of medicine has been most rapid. The appearance of the *Journal of Experimental Medicine* is evidence that the product of these laboratories is such as to warrant the publication of a journal devoted more particularly to the presentation of the researches conducted in them.

As will have been already inferred, the immediate object of the *Journal* is to afford investigators a medium for the publication of their work in all its details and with abundant illustration. During the past few years the absence here of a suitable periodical has not infrequently led our investigators to send their papers abroad for publication in journals where they would be associated with other work of similar scope. In consequence the credit of not a little of our best scientific work has been lost to America, and the stimulus to our investigators afforded by the presence among us of a journal devoted to the publication of the results of experimental investigations has been lost.

As indicated by its title, the scope of the new journal is somewhat limited. It is not intended that it shall be a general medical journal, presenting the advances in all departments of medical science, but simply in those dependent for their progress upon research of an experimental nature. It will consequently present for the most part the results of studies in physiology, pathology, pharmacology, and experimental medicine, each of which subjects is very ably represented upon the editorial staff.

The first number comprises 210 pages, and presents seven articles handsomely printed and well illustrated. Subsequent numbers will appear as the matter for them is accumulated, but it is intended to publish at least four such numbers yearly. The subscription price is five dollars.

In the department of Medical Progress we shall take occasion to review several of the articles contained in this first number of the *Journal of Experimental Medicine*, but in the meantime we would extend to it our greeting and best wishes for a long and successful career.

J. S. E.

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A TREATISE ON NERVOUS AND MENTAL DISEASES, FOR STUDENTS AND PRACTITIONERS OF MEDICINE. By LANDON CARTER GRAY, A.M., M.D. Second edition, revised and enlarged, with 172 illustrations and 3 colored plates. New York and Philadelphia: Lea Brothers & Co., 1895.

NUMEROUS changes are noticeable in the second edition of this attractive volume, already so familiar to the profession. The anatomical portion has been largely rewritten, and in addition three beautiful colored plates illustrating localization and function have been added. That portion dealing with nervous histology has been brought up to date and embraces the latest researches of Ramón y Cajal and Andriezen. In addition five new chapters have been added, namely, on Dementia, Dementia Paranoides, Confusional Insanity, and Delirium, and one on Massage. In consequence of the amount of new matter added the author has omitted, and we think very wisely, the pages devoted in the first edition to bibliography. The glossary, so useful in a book of this kind, and also the index, have been much amplified. As in the former edition, the author spends much time upon the subject of treatment, speaking in the authoritative style so familiar to his readers. In numerous portions the consideration of treatment has been expanded. The favorable impression created by the first edition is certainly enhanced by the one before us. In addition to the colored plates already mentioned, a number of new illustrations have been added.

The publishers are also to be congratulated upon the fine appearance of the volume, as shown in the beauty of the printing and of the illustrations.

F. X. D.

# PROGRESS

OF

# MEDICAL SCIENCE.

## THERAPEUTICS.

UNDER THE CHARGE OF

REYNOLD W. WILCOX, M.D., LL.D.,

PROFESSOR OF MEDICINE AND THERAPEUTICS AT THE NEW YORK POST-GRADUATE MEDICAL SCHOOL AND HOSPITAL; VISITING PHYSICIAN TO ST. MARK'S HOSPITAL.

### Treatment of Rebellious Headaches by Calomel.

M. Galliard often meets with individuals who complain of continued headache, which should not be confounded with migraine. It is continuous with paroxysmal exacerbations, but without vertigo, nausea, or vomiting. It is generally frontal, rarely temporal, vertical, or occipital, and does not present painful points. The sleep is not disturbed. It is more frequent in women, and is generally in relation with neurasthenia. But apart from the persistent headaches of neurasthenics are headaches which are independent of neurasthenia, whose pathogenic relations are unknown, and like them are marked by their persistency and resistance to analgesic drugs, and generally to the usual remedies. With these one and one-half grains of calomel taken in the morning for six mornings, fasting, have succeeded in some cases. The mouth should be watched for stomatitis. On the third or fourth day there are likely to be colic and diarrhœa, and rest in bed may be necessary. Breaches of diet and chilling must be guarded against. If the first series fails, after a few weeks of interval repeat; if the second fails, it is useless to insist further.—*Journal des Praticiens*, 1896, No. 9, p. 140.

### The Treatment of Gonorrhœa by Bismuth Subacetate.

Dott. Bendetto Costantini reports four instances of its use, concluding that in a fine and impalpable powder placed in contact with the urethral mucous membrane it acts as a protective, diminishing and then abolishing the irritation produced by the passage of urine. Acting as an astringent and cicatrisant, it diminishes the action of local hyperæmia. Microscopic investigations show that it is an obstacle to the development of the gonococci, and it is also active against the common pyogenic germs, thus diminishing the danger of chronic urethritis. It can be used as an excellent substitute for other astringents and antiseptics, with the further advantage of being more active and odorless. One, two, or even three(!) injections may be made each day. It appears from these observations that the remedy may be used during the entire time of treatment, and that habituation on the part of the urethra does not occur. It is of advantage to use this in conjunction with irrigations of sterilized water.—*La Riforma Medica*, 1896, No. 35, p. 418.

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### Poisoning by Copper Sulphate.

Dott. Domenico Gentile reports four instances of probable poisoning by this substance. In all there was a history of previous good health, sudden onset of gastric disturbance more or less severe, speedily followed by pains, accompanied by dysphagia, cramps, headache, vertigo. The appearance of vomiting terminated the severity of the symptoms. In only one instance was there renal disturbance—trace of albumin, excess of urates and phosphates. It is probable that the copper used in viticulture against the *peronospera* in some manner found its way into the wine which had been drunk and thus gave rise to the symptoms.—*La Riforma Medica*, 1896, No. 42, p. 404.

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### Cocaine and Cocainism.

Dr. A. Sallard places the fatal dose for healthy subjects from eight to twenty-three grains, while a patient suffering from prostatitis died after an urethral injection of the smaller quantity. The symptoms of acute poisoning are somewhat variable, fugitive vertigo, in nervous subjects symptoms of excitement, tingling of fingers and toes, ringing in ears, irresistible impulse toward movement, gesticulation, extreme loquacity, attacks of anger, weeping, or nervous crises. Sometimes there are depression, vertigo comparable to sea-sickness, palpitation, loss of consciousness, facial pallor, mydriasis, cold extremities, and profuse perspiration. Convulsive phenomena indicate a profound intoxication, but not incompatible with recovery, provided that they remain moderate and at sufficient intervals. If there is dyspnœa from tetanus of the respiratory muscles and increasing cyanosis, asphyxia is indicated, and this will be the cause of death and is absolutely characteristic of acute intoxication. Poisoning of rapid progress is almost entirely due to the introduction of the poison into the general circulation by hypodermatic methods, instillation, or application. The duration of the symptoms is generally short, death or recovery soon taking place. Cerebral anæmia is usually slight, and disappears in from one-half to one hour; but convulsive accidents leave more marked traces, the normal condition only being reached after two or three weeks. To avoid these dangers various expedients have been proposed —association with glonoin (Gauthier), cocaine phenate (Oefèle and Glück), tropa-cocaine (Goesel). Magitot proposed the following precautions: The dose to be proportional to surface of anæsthesia; avoid neuropathics; subjects suffering from cardiac or respiratory diseases; avoid introduction into veins; keep the patient in a horizontal position; use only a pure drug; introduce by fractional doses, first using only an experimental injection of one-sixth of a grain. The treatment depends upon the symptoms; loquacity will disappear of itself, syncope by horizontal position, percussion of face and chest with wet towels, inhalation of ammonia, acetic acid, or, better, amyl nitrite, injections of ether or caffeine, or possibly morphine hypodermatically (Chouppe). Chronic intoxication shows itself by a general depression, loss of appetite, palpitation, headaches, and vertigo, or, further advanced, trembling, profuse perspiration, syncope, and even epileptiform attacks. Symptoms of delirium are usually the result of sensory hallucinations of various kinds; various tactile sensations are common; diverse forms of hyperæsthesia, cramps, and lightning-pains. There are also hallucinations of sight and hearing. At last come mental failure and weakness of the memory, complete loss of will-power, until finally the *habitués* become veritable children, weeping at every turn. The bodily condition is more impaired as the delirium becomes marked, emaciation is rapid, the eyes hollowed, pallor extreme, pulse thready, dicrotic, and irregular, blood-tension lowered, syncope frequent, and respiration often accelerated. The almost complete anorexia, digestive disturbances, and diarrhœa result in marasmus which may end in death. The treatment, immediate and total suppression of the drug, is almost always possible, but confinement in a hydrotherapathic establishment is essential. As adjuvants are the general tonics, as iron, quinine, arsenic; heart drugs, as coffee, sparteine, digitalis; hypnotics, as chloral, sulphonal, trional; nourishing food, open air, massage, systematic gymnastics, and hydrotherapy.—*Revue de Thérapeutique*, 1896, No. 6, p. 163.

[We have noted, in several instances of chronic habituation, inconsistent and unwarrantable mendacity as a constant and well-marked symptom, which persisted after the cure was otherwise complete.—R. W. W.]

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## THE DANGER OF ANTIPYRETIC MEDICATION WHEN OBTAINED BY DRUGS OF THE AROMATIC SERIES.

M. BARDET quotes Dujardin-Beaumetz, who declared that the lowering of the temperature by these toxic methods was always obtained to the detriment of the patient. He would combat the opinion that admits the supposition that antipyretics are dangerous because of any accessory toxic action. On the contrary, it is the method itself which we should fear, and not certain antipyretics only, because it is always dangerous for the organism to employ drugs which are capable of interfering with oxidation. The thermic elevation is the least important of the phenomena which we observe in the majority of cases of fever. Entirely different is it with the symptoms of intoxication due to toxic leucomaïnes which fill the tissues, and to the extractive matters resulting from incomplete combustion—these are true causes of the infectious condition of the patient. The true therapeutic indication is to favor the elimination of toxic material. Since this is slightly soluble it is necessary to change it so that it can be eliminated. This can be accomplished by oxidation, which burns up toxic products and changes them into soluble, harmless substances. The antipyretics delay oxidation, and therefore interfere with a method of defense of the organism; therefore they should always be banished from the rational therapeutics of febrile diseases. When the degree of temperature becomes alarming, cold baths will abstract heat and at the same time not interfere with the phenomena of oxidation. The aromatics should be rejected as antipyretic drugs, not because they are toxic, but because the principle itself of antipyretics is vicious. These drugs should only be used as analgesics.—*Bulletin Général de Thérapeutique*, 1896, 5e liv., p. 158.

### Scopolamine as a Mydriatic.

Dr. Arthur G. Hobbs states that this drug occupies a middle ground between atropine, which is known to produce a complete paralysis of the accommodation and retain its effects for a week or ten days, and homatropine, which is claimed by some, and denied by others, to effect a complete control of the accommodation-muscles and retain its effects for about forty-eight hours. In the first case the time necessary to accomplish a full paralysis ranges from two and a half to three and a half days, and in the second ninety minutes to two hours, according to its advocates. If a $\frac{1}{20}$ per cent. solution of this drug be used, with intervals of fifteen minutes between the instillations, for one hour, the full effect is reached quite as completely as that produced by a three days' use of atropine. The paralysis lasts from one and a half to three days. In simple refraction cases it is to be preferred to the latter drug, because it does its work much more quickly, while its decline is at the most only about one-fifth, and oftener only one-sixth, of the time required by atropine. It produces no unpleasant effects in the throat, and if the patient can take but little time from his work, a solution of eserine (1 : 3840) can be used to reduce more rapidly the pupil. The drug is used in weak solution in cases of glaucoma with very small pupils, and in some cases of iritis when atropine failed to produce sufficient dilatation of the pupils. It is used most frequently in a $\frac{1}{40}$ per cent. solution, rarely for some special reason (history of a former resistance) as strong as a $\frac{1}{10}$ per cent. It produces no increase of tension, and hence the old eye, even if it be glaucomatous, does not restrict its use, as in a greater or less degree it would in the use of other mydriatics.—*Journal of Practical Medicine*, 1896, No. 10, p. 428.

### Hypodermatic Injections of Myrtol.

Dr. S. Artault de Vevey has frequently noted that injections of oil impregnated with eucalyptus are complained of by patients because they give rise to a smell of paint in the throat. Since myrtol has been recommended by Gubler as a remedy for catarrhal discharge from the bronchial mucous membranes, and this drug, an isomer of eucalyptol, when used as above has a slight but agreeable odor, he has made use of it in simple catarrh with emphysema, abundant muco-purulent secretions, bronchial dilatation, and pulmonary gangrene, as a 10 per cent. solution in sterilized olive oil. The dose is from one to two drachms each day, injected deeply into the buttocks. In case of tuberculosis with abundant expectoration an equal amount of guaiacol can be added. The odor of the latter drug is concealed, and, thus combined, the mixture is aromatic. No untoward results supervene unless it be that with certain patients there is some nervous excitement and dull headache, which even happens when eucalyptol is used. The drug is eliminated rather by the pulmonary area than by the kidneys, and also by the skin, giving an odor to the body-linen.—*Revue de Thérapeutique*, 1896, No. 6, p. 171.

### Rectal Injections of Toxins and Antitoxins.

Dr. Paul Gibier has studied the effect produced upon certain animals by the rectal injections of the toxins and antitoxins of diphtheria and tetanus. He has reached the following conclusions: (1) In rabbits, dogs, and guinea-pigs, the rectal injections of relatively massive doses of diphtheria and tetanus toxins are followed by no apparent effects. (2) The rectal injection of even large doses of these toxins, many times repeated, does not produce the least degree of immunity against the toxin thus injected. (3) The rectal injection of doses of diphtheria and tetanus antitoxin, at least a thousand times larger than the preventive subcutaneous dose, is powerless to prevent death from a minimum fatal dose of diphtheria or tetanus toxin. (4) The rectal mucous membrane may retain the active principles of the toxins and the antitoxins, or it may destroy them. In case it permits their absorption the inference is indubitable that they are carried through the portal system to the liver and are destroyed by that organ.—*New York Therapeutic Review*, 1896, No. 2, p. 27.

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### The Treatment of Diffuse Bronchitis in Children.

M. Renault believes that a simple and harmless method consists in giving a bath at 100.4° F. for seven to eight minutes every three hours, until the temperature, taken three hours after the last bath, has reached 102.2° F. After the third or fourth bath the fever falls without again rising, and the disease becomes a slight bronchitis, without, however, even becoming capillary. The only drug which is employed is quinine sulphate, which acts as a general tonic.—*Journal des Praticiens*, 1896, No. 13, p. 205.

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### Phenol Sulpho-ricinate.

Dr. Theodore Heryng has made use of this remedy in the treatment of tuberculous and chronic diseases of the pharynx, larynx, and nose, particularly hypertrophy of the nasal mucosa, ozæna, chronic nasal suppuration, diseases of the sinuses, pharyngitis sicca, retro-nasal catarrh, syphilis of the throat and tongue, pachydermia of the posterior wall of the larynx, laryngeal new growths (papilloma), and, finally, rhino-, pharyngo-, and laryngo-scleroma. The preparation of sulpho-ricinic acid requires ten or twelve days, and in general is the result of the action of sulphuric acid on castor oil, washing with an aqueous solution of sodium chloride and neutralization with caustic soda and filtration, with subsequent purification. The final result, when the process is carried out with various precautions enumerated, is a yellow liquid of syrupy consistence, of a specific gravity of 1025 to 1030. The chemical formula is $C_{18}H_{33}O_2.OSO_3$. This substance possesses, according to Berlioz, antiseptic and disinfectant properties. It will dissolve many otherwise with difficulty soluble substances, *e. g.*, phenol, 40 to 50 per cent.; beta-naphtol, 10 per cent.; salol or salicylic acid, 15 per cent. With the first it is only necessary to place the requisite amount of synthetic phenol in a water-bath with sulpho-ricinic acid, when a perfectly clear solution without precipitation results; all preparations not fulfilling these conditions are impure and should be rejected. It should be remembered that this solution is not a new chemical compound, but a mixture. The 40 per cent. solution is not caustic when applied to the mucous membrane of the upper air-passages, although it produces a burning taste upon the tongue, and in sensitive individuals an unpleasant sensation for an hour after its application. In the nose a 30 per cent. solution is borne without reaction. In tuberculosis, before the first application, cocaine is necessary. Poisonous phenomena have not been noticed even after continued application.—*Therapeutische Monatshefte*, 1896, Heft 3, S. 125.

### THE USE OF NITROGLYCERIN IN ANGINA PECTORIS.

DR. THEODORE SCHOTT reviews the literature and concludes that it is most effective in clear angiospastic cases of angina. Next, where heart-cramp is dependent upon aortic insufficiency. In stenosis the result of myocarditis, fatty and "weakened" heart, it is not so useful. In chest-pain caused by aortic aneurism its action is at most only insignificant; as for the purely motor neuroses it is very rarely of advantage. In no patient can the result of its use be foretold, but from its use it can quickly be ascertained whether or not it is beneficial. Small doses are not toxic, and when these are not effective the amount can be increased. The form in which the remedy is applied is important; the best is the liquid—nitroglycerin, 2; tincture of capsicum, 25; purified alcohol, 125; and peppermint water, 125. Of this mixture the dose is from two to ten drops. Although other remedies are necessary in treatment of the underlying cardiac conditions, yet for angina pectoris nitroglycerin will always play an important part.—*Therapeutische Monatshefte*, 1896, Heft 3, S. 139.

### THE PHYSIOLOGICAL ACTION OF KOLA.

DR. G. WALTER BARR believes that this drug has a special action upon the cerebro-spinal and sympathetic nervous system, which is not at all like that of caffeine, and is due to some other active principle. The primary action is an increase of functional power in the cerebro-spinal system, and an increase of functional activity in the sympathetic system; overstimulation reverses the action, as is the physiological rule; but there is no after-depression of the cerebro-spinal system and none of the sympathetic except from massive doses, and then only of the portion most sensitive to the action of the drug—certain reflexes and venery. The overstimulation-paresis of the cerebrum has marked physiological effects, which are dangerous if the toxism be continued. The action of this drug upon the cerebro-spinal system has marked manifestations in the muscular system. The action upon the sympathetic causes increased peristalsis and secretion, contraction of the arterioles, and consequent rise of tension, the latter being partly due to increased heart-action, and this last being another manifestation of stimulation of the sympathetic ganglia. There is primary increase of the reflexes and venereal power, which is reversed from overstimulation of that part of the sympathetic before the other less sensitive portions are depressed. The urine is lessened. There is no approach to the formation of a habit, and no tolerance is established. Euphoria is marked. Excretion often does not take place for over six hours, and the overlapping of doses sometimes produced toxic effects when each dose was medicinal. There is such variation in susceptibility that no physiological data can be of value. The drug must be used with discretion, and, like all drugs acting markedly upon the sympathetic nervous system, is apt to produce untoward effects in certain individuals. The antidotes for its toxic effects are strychnine and hard exercise. Death will probably come from cardiac paralysis, but it ordinarily requires massive doses to produce this.—*Therapeutic Gazette*, 1896, No. 4, p. 221.

### THE BINIODATED OIL OF PANAS.

DR. ROCHON-DUVIGNEAUD states that this is prepared as follows: 1. The oil is purified by agitating superfine virgin olive oil, 100; with 95° alcohol, 30; for four or five days, and then decanting. This removes the oleic acid. 2. The oil is now sterilized in a capsule for ten minutes at a temperature of 230° to 239° F. Above this temperature there are discoloration and emission of carburetted gas—a sign of decomposition. The temperature is now allowed to fall to 149° or 158° F., when mercuric biniodide is added to the amount of four-tenths of 1 per cent. until complete solution is obtained. The temperature is maintained at the degree above named, making use of a thermometer as a stirring-rod. Below this temperature the mercury will not dissolve; above this it becomes yellow and insoluble. The sides rather than the bottom of the capsule should be heated so that the mercury at the bottom shall not be overheated and thus rendered insoluble. To prevent the mercury forming masses with the oil it is preferable previously to rub up the mercury with a little sterilized water to form a paste. After the mercury is well dissolved in the oil it should be filtered through sterilized cotton into perfectly dry, sterilized flasks, and kept protected from the light. The injections for syphilis are made every second day, and are not hypodermatic, but intramuscular, the needle being vertically thrust into the tissues up to the guard; the site of election is the buttock between the crest of the ilium and the ischium, the patient being sitting. There is but slight pain; the nodosities are small and not well marked, and abscess has not occurred.—*Journal des Praticiens*, 1896, No. 13, p. 197.

### THE DIURETIC ACTION OF SAMBUCUS NIGRA [ELDER].

DR. G. LEMOINE, in 1888, succeeded in establishing diuresis, when other methods had failed, by the use of an infusion of the bark, the patient being a woman suffering from general anasarca, pulmonary œdema, and ascites, the result of a subacute nephritis. The properties most desired seem to exist in the second bark, but all attempts to isolate an alkaloid or glucoside have failed, although it has been found to contain, among other substances, valerianic acid, fat, tannic acid, and salts of potassium. The last investigations have been made with an alcoholic fluid extract, to which the name sambucinum has been given. So far this preparation has been used to obtain diuresis in nephritis and diseases of the heart and liver. It is apparently powerless to relieve the dropsies which accompany cardiac asystole, but when diuresis has been commenced with digitalis or caffeine it seems to continue in large amount. No unpleasant effects have been observed; even in albuminuria it apparently does not increase the renal congestion. It may give rise to a diarrhœa or rather increase one already existing, but this need not be objectionable in assisting the evacuation of the œdema. The dose is one-half an ounce.—*Bulletin Général de Thérapeutique*, 1896, 6e liv., p. 252.

## ALBUMINURIA AND SUBACUTE URÆMIA FOLLOWING THE APPLICATION OF A BLISTER.

DR. H. HUCHARD reports a single instance in which a young girl, for the relief of gastric disturbance with obstinate constipation and severe abdominal pain, received over the stomach a blister rather more than two by three inches in size, which remained in place ten hours. The urine, before its application, was found to be free from albumin. Five days afterward swelling of the face and sharp lumbar pains were complained of, and albumin was found in the urine. In spite of a milk-diet, disturbances of vision, persistent headache, nocturnal agitation, intense dyspnœa, accelerated respiration, nausea and vomiting, convulsive attacks in face and limbs, and almost complete amaurosis supervened. The urine became reduced to about twelve drachms in amount and very albuminous. After active treatment, calomel and scammony, venesection, wet cupping over loins, purgative enemata, theobromine, wet packs, and enteroclysis, rapid recovery took place. In conclusion it may be stated that we well know the inconveniences and dangers of a blister, and that in the majority of diseases there is no advantage in its use.—*Revue de Thérapeutique*, 1896, No. 7, p. 195.

M. DE CRÉSANTIQUES has observed two patients who died after the application of blisters. In case of febrile diseases a catharidal blister should not be prescribed, because the kidneys are already irritated by the passage of toxic urines, and there is necessity for great care of these organs.—*Bulletin Général de Thérapeutique*, 1896, 6e liv., p. 187.

## THE TREATMENT OF ERYSIPELAS BY ANTISTREPTOCOCCIC SERUM.

M. BOLEGNESI cannot agree with Chantemesse, who, after twelve months' use of Marmorek's serum, is of the opinion that it should be applied to the exclusion of all other methods of treatment. In considering statistics of this disease the various grades of severity which this disease presents must be considered. It may be remarkably mild or severe, as in old individuals and alcoholic subjects. Further, returns of the disease are common, and subsequent attacks are milder because of the attenuation produced by the previous ones; at least two-thirds of the cases fall in the last category. The remainder are severe because they are acute or have attacked aged individuals or those whose nervous system, heart, and kidneys are in poor condition, or, again, on account of the great virulence of the streptococcus of Fehleisen. Quoting his own results: Making use of boric vaseline, six died of two hundred and fifty—a mortality of 2.4 per cent. Ichthyol ointment was used in two hundred instances, at least one-half of these were acute. The mortality was 2 per cent.—the four deaths were at the ages of seventy-three years, seventy years, sixty years, and forty-two years. The method of Juhel Renoy, principally by ichthyol-traumaticin, gave one death in one hundred and fifteen patients—a percentage of 0.90. Contrasted with these results should be placed the statistics of Chantemesse of one thousand and fifty-five cases, of which thirty-four were fatal—a mortality of 3.22 per cent. The treatment may be summarized as follows: 1. In benign cases all local treatments are justifiable, provided that they do not injure the skin; preference is for ichthyol ointment. 2. Clearly acute cases of regular progress should receive the treatment of Juhel Renoy—ichthyol-traumaticin—which will be more than one-half of the cases. 3. Severe cases should receive the cold bath of from twelve to fifteen minutes at 64.4° F. every three hours, with effusions upon the neck. In very severe cases, complicated by anuria and cardiac irregularity, these baths should be given every two hours, lasting only from five to seven minutes, with effusions during the entire time of the bath.—*Bulletin Général de Thérapeutique*, 1896, 40e liv., p. 110.

### ANAL PRURITUS.

DR. L BROCQ insists upon (1) absolute suppression of wakefulness, fatigue, all kinds of excesses, and physical and intellectual exhaustion. He prescribes tranquillity, and, when possible, country life, outdoor exercises, avoidance of bicycle and horseback exercise. All excitants are prohibited, tobacco, coffee, tea, *liqueurs*, alcohol, strong wines, pastry, preserved fish, game, truffles, *pâte de foie gras*, and old cheese. (2) Regulation of the passages and not to visit the closet before anointing the anus and surrounding parts with pure vaseline or fresh cold-cream. (3) Bathing the painful points, morning and night, with a decoction of cocoa-leaves, as hot as it can be borne, to which is added a glycerin solution of carbolic acid. (4) Keeping the anus well powdered with a mixture of powdered talc and zinc oxide. (5) Applying every third day a 20 per cent. solution of silver nitrate. (6) Using for severe attacks at dinner and bedtime a capsule containing seven grains of antipyrin. (7) Using hot sedative douches and static electricity.—*Journal des Praticiens*, 1896, No. 12, p. 182.

### TANNALBIN.

DR. R GOTTLEIB states that a preparation of tannin is desirable which remains insoluble in the stomach, and so does not interfere with its functions, and, further, is not readily soluble in the intestine, so that it may reach the lower portion of the small and even the large intestine. To meet this indication the observation that albuminous bodies after prolonged heating at high temperatures became soluble with difficulty, or even insoluble in the stomach, was made use of, and it was found that tannin albuminate behaved in the same way. This substance, after prolonged heating, became so resistant to pepsin-digestion that after several days' contact it remained undissolved. Further, the solubility of this in a 1 per cent. soda solution and in pancreatic digestion gave good reason for the opinion that the drug would be useful in the intestinal canal. These conditions were brought about after exposure for five or six hours to a temperature of 230° to 248° F., and the resulting preparation is a tasteless, pale-yellow powder, containing about 50 per cent. of the acid.

DR. R. VON ENGEL finds that in many cases, especially of chronic catarrh, that a direct action upon the alimentary canal is desirable. The mineral astringents present many disadvantages, and we naturally turn to the vegetable or tannin-containing drugs. His observations were made upon forty patients, and did not develop any untoward symptoms. The dose is fifteen grains for adults and one-half the quantity for children, twice to four times daily, although the dose-interval may be considerably lessened, so that the daily amount may be administered within a few hours. The treatment may be continued for two to four days, even to twenty days if necessary. The patients do not complain of nausea, heaviness, nor vomiting. The conditions for which the drug is used are various intestinal catarrhs, congestions from circulatory disturbance, diarrhœa of chronic tuberculosis and of nephritis. In general, it is to be especially recommended in acute diarrhœas, chronic intestinal catarrhs, and the diarrhœa of tuberculosis.—*Deutsche medicinische Wochenschrift*, 1896, No. 11, S. 163.

## MEDICINE.

UNDER THE CHARGE OF

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### Lead-gout and the Influence of Lead-poisoning on the Excretion of Uric Acid.

Luethje (*Zeitschrift für klin. Med.*, Bd. 29, p. 266), working under direction of G. Klemperer, has published an exhaustive article on this subject, from which the following conclusions are quoted:

1. Investigation of the literature and some cases observed by the author prove a close relationship between lead-poisoning and gout.

2. It is possible that lead alone, without other etiological factors, is capable of causing gout.

3. Lead-poisoning has no influence on the excretion of uric acid. Lead does not cause retention of uric acid. The fact that in cases of lead-poisoning increased quantities of uric acid are found in the blood is due to overproduction. How lead does this cannot be determined. Lead is probably able to cause the so-called "gout-necrosis."

4. In order to bring on an attack of gout a very long-continued intoxication is necessary.

5. The clinical course of lead-gout exhibits some peculiarities as compared with the ordinary form. The first attack occurs, as a rule, at a relatively early age. It has a tendency to spread with great rapidity over many joints. Joints are frequently involved that are rarely or never affected in true gout

—hips, vertebræ, shoulder. Tophi and deformities are more marked than in ordinary gout.

6. The prognosis is always unfavorable, largely on account of the other results of lead-poisoning, especially contracted kidney.

### SECOND ATTACKS OF MEASLES AND IMMUNITY.

GOTTSTEIN reports the case of a girl who had measles for the first time at eight years, and a second attack two years later. From the origin of the infection and the clinical features the diagnosis seems quite certain. An interesting feature was that in the first attack the skin was severely affected, but the catarrhal symptoms were extremely mild. In the second attack the throat symptoms were severe and characteristic, but the exanthem did not appear until two or perhaps three days after the usual time, as indicated by the other symptoms, was imperfectly developed, and soon faded.

The author thinks the case illustrates the theory of immunity proposed by Schleich and himself two years ago. In the first attack the child did not acquire general immunity, since it was reinfected at the next opportunity. There was, however, a local resistance on the part of the organ most affected in that attack which modified the later one in the manner described.—*Münchener med. Wochenschrift,* 1896, No. 13.

### RECOVERY FROM TUBERCULAR MENINGITIS.

To the few cases positively recognized, JANSSEN, of Maastricht, adds the following: An infantry corporal, nineteen years of age, was admitted to the hospital on account of headache, stupor, and pain in the extremities. The previous history was negative; no tuberculosis; no syphilis. The headache was chiefly frontal. The conjunctivæ were injected, the pupils unequal; no strabismus. There was frequent vomiting; the bowels were confined; pulse 92, dicrotic; respiration superficial. The diagnosis of meningitis was confirmed by the after-history. The pulse became slower, reaching 42; the temperature was only moderately elevated; headache, often most intense, persisted; dilatation of the pupils, strabismus, opisthotonos, tâches cérebrales, hyperæsthesia of the skin, contractures in the left knee, involuntary evacuation of urine and feces, sordes on the lips, teeth, and tongue, and complete unconsciousness appeared. Sixteen days after admission the condition improved, and a month later the patient was discharged well. Later, symptoms of pulmonary tuberculosis came on, and the man died three months and a half after the onset of the meningitis. The autopsy revealed masses on both sides of the longitudinal fissure, 4 cm. long and not quite 2 cm. wide. These were made up of soft, friable tubercles, following the course of the vessels. Smaller tubercular masses were also present on the base of the brain and on the optic chiasm.

The treatment of the meningitis consisted in ice-bags to the shaved head, poultices over the whole body up to the neck, leeches to the septum of the nose, and potassium iodide, internally, in doses of at first 8 grammes daily, increased to 40 grammes—altogether 950 grammes. The drug was borne without serious effects. All the secretions contained iodine, and to this the author ascribes the recovery (in which case it must be regretted that the treatment was not followed after the lung-tuberculosis was discovered).—*Deutsche med Wochenschrift*, 1896, No. 11, p. 169.

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## THE DIAGNOSIS OF TUBERCULOSIS IN INFANCY.

A recent article by H. KOSSEL on "Tuberculosis in Early Childhood" contains some interesting details. The well-known difficulty of obtaining sputum was overcome by wiping the secretions out of the pharynx with a tuft of cotton. In several cases of pulmonary tuberculosis the bacilli were found in the feces. In some cases pus from the middle-ear was found to contain bacilli. Tuberculin was used for diagnostic purposes as follows: From 0.2 to 1.0 mg. was injected, and if no reaction followed five to ten mg. were injected. If the temperature rose, a similar dose was injected a second time, after defervescence, for the sake of greater certainty. Of sixty-three children so treated twenty-eight gave the reaction, and of these only four gave clinical evidences of tuberculosis.—*Zeitschrift für Hygiene und Infectionskrankheiten*, Bd. xxi. 41.

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## INFLAMMATORY ENLARGEMENT OF THE HEAD OF THE PANCREAS.

RIEDEL calls attention (*Berliner klin. Wochenschrift*, 1896, Nos. 1 and 2) to a rare but important disease of the pancreas. This is a process due to gall-stone, apparently without the co-operation of micro-organisms, in which the head of the pancreas becomes converted into a tumor of stony hardness. Though obstinate, a suitable operation may lead to recovery. Three cases were observed. At the autopsy of one of these, interstitial pancreatitis was found. The most important condition that may be mistaken for this is carcinoma, as happened in the first of Riedel's cases. The further course excluded cancer. In the second case the tumor was mistaken for the gall-bladder.

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## TUBERCULAR MENINGITIS AND TRAUMATISM OF THE CRANIUM.

SCHILLING reports (*Münchener med. Wochenschrift*, 1895, No. 40) the case of a boy of eight years who showed brain-symptoms eleven days after a severe fall. Fracture of the inner table was suspected, with irritation by fragments of bone, but before an operation could be made the patient died. Autopsy showed tubercular meningitis and cheesy softening of the bronchial glands. It would seem most probable that the bacilli in the latter, where they were comparatively harmless, getting into the lymphatic vessels and circulating therein, found at the seat of the injury favorable conditions for their development.

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## MORVAN'S DISEASE AND ITS RELATION TO SYRINGOMYELIA AND LEPROSY.

PRUS (*Archiv für Pyschiatrie*, Bd. xxvii., Heft 3) reports the following: A Galician Jewess, forty-six years old, began to feel pain in the right arm and weakness in the right shoulder. Then perforating ulcers formed in the region of the left internal and right external malleolus, followed by painless whitlows on the fingers. Later, anæsthesia of the finger-tips, paræsthesia and pain in the neck and arms, anæsthesia of the tongue, loss of teeth, and difficulty in speaking appeared. Atrophy of the phalanges, anchylosis of the phalangeal joints of the toes, of the carpus and elbow came next; the fingers were greatly deformed; walking became difficult. Among the other symptoms present at the time of the report, eight years after the onset, were white spots on the skin of the hand, atrophy of the nails and various muscles, with reaction of degeneration, disturbance of sensation, vasomotor anomalies, and diminution of the skin and tendon-reflexes. By a very complete process of exclusion, described in full in the original, a diagnosis of Morvan's disease was made.

Examination of the blood disclosed, in addition to anæmia and leucocytosis, bacilli which had all the characteristics of lepra bacilli, and, as miliary tuberculosis was evidently not present, a diagnosis of leprosy was made.

Prus, therefore, takes sides with those who deny the existence of Morvan's disease as a distinct process and see in it merely a form of anæsthetic and mutilating leprosy. According to the author, too, many cases of syringomyelia belong to the same category. His explanation of the process is as follows: After the lepra bacilli have penetrated the skin deeply they develop in the sheaths of the cutaneous nerves and cause degeneration of the fibres. From this various trophic disorders and alterations of sensation may occur. Later the bacilli affect the larger nerve-trunks, so causing paresis and muscular atrophy. If the spinal cord is reached, the bacilli develop in the neuroglia, especially in the gray matter, causing growths of the glia with subsequent retraction, whereby cavities are formed. It is possible that other things besides leprosy can cause such processes in the cord, but only the bacteriological examination can decide in any given case.

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### SPASTIC PARALYSIS DUE TO MULTIPLE SCLEROSIS.

LAPINSKY (*Zeitschrift für klin. Med.*, Bd. xxviii. p. 365) reports two cases of this kind. In the first the clinical features were those of a pure spastic paralysis from beginning to end, with the exception that a transitory incontinence of urine appeared early in the history. Post-mortem examination showed multiple sclerosis, with numerous foci in the brain and cerebellum and in all parts of the gray and white tissue of the cord.

In the second case there were temporary partial loss of sensation of the right hand and slight atrophy of the interosseous and volar muscles of the same. The diagnosis was spastic paralysis, probably multiple sclerosis. Autopsy confirmed the latter.

The author adds to the recital of these a study of the various processes that may produce the clinical picture of spastic paralysis. These are arranged in groups with reference to the original sources.

The group of cases of spastic paralysis with the anatomical basis of multiple sclerosis includes eleven references, not including the author's. In three others no autopsy was made, but the clinical diagnosis of multiple sclerosis was made later. In six of the former the clinical picture of spastic paralysis was especially distinct.

The article includes a description of the histological changes in the two cases, with plates.

### ON THE JAUNDICE OF RECENT SYPHILIS.

NEUMANN (*Wiener med. Presse*, 1895, No. 45) gives the results of some recent observations. Within the last three years he has seen thirteen cases of jaundice in recent syphilis, nine of the cases being in women. In eight cases jaundice appeared at the same time as the eruption, in three after it, in two before it. In two cases there was recurrence of eruption and jaundice simultaneously. In ten cases there were no gastric or intestinal disturbances. An etiological relation between syphilis and jaundice may be claimed when the latter appears without gastric disturbance, when it appears at the same time as the exanthem, and when there is enlargement or tenderness of the liver; when there are other syphilitic intestinal diseases, and especially when specific treatment causes the jaundice to disappear. Neumann thinks the jaundice in these cases is most probably due to vascular changes.

### THE ENLARGED SPLEEN OF CIRRHOSIS OF THE LIVER.

OESTREICH (*Virchow's Archiv*, Bd. 142, p. 285) has examined a large number of cases of cirrhosis of the liver, post mortem, with the object of determining the cause of the splenic tumor. He finds that, contrary to the common idea, congestion has nothing to do with the enlargement of the spleen, either in atrophic or hypertrophic cirrhosis, and holds that the change is due to irritative processes independent of the liver. There is at first a cellular proliferation, with hyperplasia of the pulp, which later undergoes induration and finally atrophy. The follicles and vessels remain normal. The irritative substance is probably carried by the artery, and the anatomical similarity in different cases seems to indicate a single etiological factor.

### LANDRY'S PARALYSIS.

REMLINGER reports the case of a healthy individual whose only previous illness had been a slight malarial attack, and who in one night was suddenly attacked with paraplegia. Following this the case pursued the typical course of a Landry's paralysis, with the exception that fever was absent and there was no loss of control over the sphincters.

At the autopsy no gross lesion could be made out in the cord, except that the gray substance at the margins of the anterior horns was a little reddened in color.

Cultures were made from the cord-substance in the cervical, dorsal, and lumbar regions, and all showed a pure growth of the streptococcus pyogenes. Cultures from the heart's blood were negative.

Sections of the cord were examined by Marinesco, and showed dilatation and inflammation of the vessels of the anterior fissure and their branches. The blood in these vessels contained a great excess of leucocytes, though not a sufficient number to block them entirely.

The cells of the anterior horns were free from bacteria, but between them, probably in lymph-spaces, chains of streptococci could be seen in the cervical portion of the cord.

The dorsal and lumbar portions of the cord failed to show bacteria in the sections, though the cultures were positive. The only cellular lesion was one of rupture of the prolongations of the cells of the anterior horns.

There were no malarial parasites seen in the sections.

Remlinger states that this is one of the first cases in which a full bacteriological examination has been made.—*Comptes Rendus de la Société de Biologie*, April 3, 1896.

### Chronic Membranous Bronchitis.

Claisse reports an interesting case of this disease in which he studied the bacteriology.

The patient had suffered from the disease for some years, and was constantly expectorating bronchial casts.

Cover-slips from the casts showed various organisms, and these were often impure, but in all of them streptococci were found.

Sections of the false membrane showed on the inner surface numerous micro-organisms of varying kinds, probably, Claisse thinks, coming from the saliva; in the depth of the membrane only streptococci were found.

The author concluded that the disease was due to the streptococcus, and the patient was put upon injections of Marmorek's anti-streptococci serum.

After two months' treatment the patient was discharged much improved, the cough and oppression across the chest having disappeared, and the expectoration having almost ceased.

The reaction to the anti-streptococci serum Claisse regards as further proof of the nature of the disease.—*Comptes Rendus de la Société de Biologie*, April 3, 1896.

### Spasm of the Neck Associated with Optical Illusions.

Féré, after remarking on the fact that the history of functional spasms of the neck points to most of them being due to irritation of the motor cortex, calls attention to a case in which there were signs denoting also irritation of the sensory cortex.

The patient was a woman of forty-nine years, who had had no nervous symptoms until she was eighteen. At this time she was very much frightened by a deformed beggar, and following this fright became very nervous and subject to nightmares, in which she constantly dreamt of the deformed beggar, the vision always appearing on the right side, while on the contrary, at the time of the fright, the beggar had appeared on the left.

At the age of forty-five years she fell downstairs, and was much frightened, though not much hurt. Some weeks later she began to observe a spasm in the neck, the head being turned to the left. The spasm was at first intermittent, coming on after fatigue or an attack of insomnia, but the movements gradually increased, and she developed a typical spasmodic torticollis. The spasms disappeared during sleep, and were much improved by rest. The most annoying feature of the case was the fact that at the time of the spasm, when the head is half turned, there always appeared on the right-hand side of the patient an image of the deformed beggar, which was exactly similar to that seen in her dreams. The hallucination appears with the eye either open or shut.

This case illustrates almost surely, Féré thinks, a cortical lesion producing both the torticollis and the optical illusion. Such cases are rare, but one case has been recorded in which a similar spasm was associated with auditory disturbances.—*Compte Rendus de la Société de Biologie*, March 20, 1896.

### A Case of Hereditary Periodic Vomiting, Diarrhœa, and Vasomotor Disturbance.

Kelling (*Zeitschrift für klin. Med.*, Bd. xxix. p. 421) describes in full the case of a woman, aged forty-two years, whose grandmother and mother, as well as herself, had attacks coming on periodically, with dizziness, fainting, vomiting, and diarrhœa, preceded by œdema of the extremities, often migrating or appearing and disappearing in time in various parts. Urine passed during the attacks was more acid and more toxic than that passed afterward. The attacks seemed to be brought on by emotional disturbances, and had no relation to barometric changes. The author considers the condition hysterical. No drugs had any effect in preventing the attacks, though morphine was of benefit in lessening their severity and postponing them for a short time. Mental quiet, fresh air, good food, and at the time of the attack opium suppositories and a hot plate over the abdomen (for the relief of pain) were useful.

## SURGERY.

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### The Treatment of Glenard's Disease by Abdominal Section.

An interesting case of this curious abdominal disorder, with its cure by abdominal section, is reported by Treves (*Brit. Med. Journ.*, January 4, 1896).

The patient was a young lady, twenty-two years of age. She had been ill for six years with distressing but somewhat indefinite abdominal troubles. There was a tubercular history. Her trouble began with an acute abdominal disturbance attributed to an ulcer of the stomach or to ulceration in the small intestine. There was also the history of a fall previous to this attack. The symptoms present were a continued catarrh of the bowels. Abdominal pain almost constant. Vomiting was common, and the vomited matter was usually intensely acid. It sometimes appeared to be composed solely of a very acid gastric juice. There were considerable digestive disturbances and still greater trouble with the bowels.

The patient had been for some time compelled to wear a belt to support the abdomen, and was unable to stand or move about without great discomfort unless this belt was in position. It was a formidable apparatus, and when in position caused a modification of the pulse of the arteries of the lower extremities.

When examined in the recumbent position the area of the hepatic dulness was normal, but when the examination was made in the erect posture the liver was found to have descended some two inches. The stomach also and the whole mass of the intestines appeared to fall downward. There was a certain amount of resistance with pain and tenderness over the region of the transverse part of the duodenum. The spleen shared in the general ptosis. The left kidney could not be felt. When in the erect posture much complaint was made of pressure upon the bladder.

An incision was made, in the operation, in the median line a little below the xiphoid cartilage. The liver and stomach were found dragged down to a remarkable degree; the great omentum was rolled into a cord and adherent to a mass in the upper part of the right iliac region. An incision over this mass showed it to be a collection of old tuberculous glands that were caseous and one calcareous and of stony hardness.

An examination of the abdominal viscera showed nothing abnormal but the position. The liver and stomach were returned to their normal position and fastened by stout silk sutures. The most important stitch was passed through the liver near its edge and penetrated the round ligament, which afforded a most suitable holding. The other stitch involved the round ligament and falciform ligament. Above, the sutures were passed through the fibrous structures of the parietes by the side of the xiphoid cartilage.

The patient made an excellent recovery and the troubles due to the ptosis vanished.

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## A New Aseptic Method of Closing Wounds without Sutures.

The great difficulty often experienced in closing wounds where sutures are impracticable or where they are liable to slough out from too great tension has been overcome in a great measure by Schürmayer (*Cent. für. Chir.*, 1896, No. 3, p. 49).

The use of adhesive plasters instead of sutures is not thoroughly aseptic, and to overcome this defect the author uses pieces of fine platinum wire having hooked ends. These wires span the wound, and can be rendered aseptic by flaming. At either end they are hooked into strips of adhesive plaster, that in case of a limb encircle it, so that with the wire they entirely surround it. The ends of the adhesive strips are folded upon themselves to prevent their adhering, and the hooked ends of the wire are passed through punctures in this double thickness. Aseptic gauze is laid on the skin beneath the ends of the wire to prevent infection of the wound from the adhesive plaster.

The great advantages of this method are that the tension is applied at a distance from the margin of the wound; that the wires alone come in contact and may be perfectly sterilized; they can be easily removed, either singly or all together during the dressing and then replaced; there is no strain upon the edges of the wound during their removal, and coaptation of the margins of the wound can be secured as easily and perfectly as by the use of sutures.

### NOTE ON THE AFTER-TREATMENT OF GASTROSTOMY CASES.

GOLDING-BIRD (*British Med. Journ.*, January 4, 1896) describes the following method of preventing leakage of the stomach-contents after gastrostomy: On the fourth day after the attachment of the stomach to the parietes the viscus was opened only enough to admit a No. 10 catheter, and then this small opening was dilated with tents till a short piece of rubber tubing, the thickness of the forefinger, could be introduced and tied *in situ*. The stomach-walls—from mere physical reasons—contracted now firmly round the tube, and from the time of its introduction there was not a vestige of leakage. The tube, which only projected just into the stomach, and about one inch externally, was kept corked, the cork being removed at meal-times; and then with a funnel and a tube which would pass into the lumen of the permanent tube the patient easily fed himself.

### A CONTRIBUTION TO BRAIN-SURGERY, WITH SPECIAL REFERENCE TO BRAIN-TUMORS.

In connection with the discussion of the indications for operation in the case of brain-tumors, STARR (*Medical Record*, February 1, 1896) says that the only type of epilepsy in which a question of operation can arise is that of so-called cortical epilepsy, where an irritant lesion of one region of the brain produces localized spasms. Such lesions may be of traumatic origin, as in fractures, localized meningitis, small hemorrhages or cysts, or the epilepsy may be the first sign of a beginning tumor, abscess, or sclerotic patch. It is for this class of cases that operations have been very largely undertaken in the past and are still being done.

The results obtained in such cases are, however, disappointing to this author, although after the operation a cessation of attacks may occur; these attacks are almost certain in the end to recur, and hence the patients are not actually cured. In cases in which the brain-substance has been injured the cicatrix resulting from an operation will be no less harmful than the one removed.

In regard to tumors, the difficulties in the way of operation are, first, the difficulty of locating the tumor accurately from the symptoms alone, and, second, the difficulty of reaching the tumor when accurate localization is possible. The removal of a portion of the skull for the relief of pressure is advocated by many surgeons, even when the tumor cannot be accurately located or removed. The author believes this is justifiable, as even though it may not be curative it is often palliative and lengthens the life of the patient, while it relieves him, though possibly only temporarily, of some pain. There may be produced also marked changes in the circulation which will permit the absorptive power of some drugs to come into play. For it is not to be forgotten that there are cases of brain-tumor in which the diagnosis is perfectly certain which have recovered under the use of mercurial inunctions together with very large doses of iodide of potassium. The author illustrates this fact by a case in which a complete recovery followed this method of treatment in a young boy with a perfectly clear non-syphilitic history. This case shows that even in some individuals in whom there is no history of syphilis medical treatment for a brain-tumor occasionally succeeds.

In regard to the radical cure of tumors by operation, accurate diagnosis and the possibility of reaching the tumor are necessary. It is now possible to distinguish sharply between the general symptoms common to tumors in any location and those that are strictly local in their significance. One local symptom to which the author calls especial attention is the change in the percussion-note elicited by auscultatory percussion of the skull, to which Macewen first called attention, and which the author has confirmed; that is, on the side of the abscess or tumor there is sometimes found a clearer, high-pitched, and more resonant note than upon the opposite side.

In a small proportion of brain-tumors it seems easy to determine the fact that the tumor must lie in a definite position, and if this position is upon the convexity of the hemisphere where access to it through the skull is easy, it seems justifiable to undertake an operation. Another difficulty in the way of operation is the fact that the nature of the tumor is always a matter of uncertainty until the tumor is exposed.

It is only when the tumor is small, lies on but does not invade the cortex, and can be removed without serious damage that the prognosis is absolutely good.

The author continues with a table of the results of operations for brain-tumors, a table of the variety of tumors removed and the results, and a complete bibliography of all tumors trephined for and removed; trephined for, found, but not removed; and trephined for, but not found.

## TRAUMATIC DIASTASIS OF THE ACROMIO-CLAVICULAR JOINT.

BÄHR (*Cent. für. Chir.*, November 2, 1895) reports a case of diastasis of this joint, and comments upon the difficulty of diagnosis and the rarity of the recognition of this common traumatism.

This traumatic diastasis is the consequence of an injury to the ligaments, which are not sufficiently injured to produce a luxation of the clavicle. It may result from traumatism or from a partially healed luxation of the clavicle or even an oblique fracture involving the joint. The diagnosis is difficult in fresh cases; the ordinary symptoms are not markedly present. The most certain symptom is a gliding of the acromion beneath the clavicle on abduction of the arm and the reduction when the arm is adducted. There is great pain on abduction, so that etherization is sometimes necessary.

## THE TREATMENT OF FRACTURE OF THE PATELLA WITH CONTINUOUS EXTENSION AND WITHOUT CONFINEMENT TO BED.

BRYANT describes, in the *Medical Record*, 1896, vol. xlix. No. 14, the following method of treating recent fractures of the patella, which he has found satisfactory in thirteen cases. The plan is presented, the author says, not as a substitute for operative measures, but as an adjunct to them, as the patient can with this appliance be about without special danger or discomfort after wiring, etc.

A plaster-of-Paris cast is applied to the leg, beginning at the bases of the toes and extending up to and partly embracing the lower fragment of the patella, and allowed to dry. An ordinary Buck's extension is next applied to the thigh. The adhesive plaster extends from the perineum to the upper border of the upper fragment and terminates in a loop at either side of the limb a little below the knee. After the plaster has become firmly adherent gentle traction is made by attaching elastic cords, which pass under the sole of the foot to the loops on either side of the knee, and a plaster-of-Paris cast is applied to the thigh, reaching from the upper limit of the adhesive plaster down to the upper fragment, where the plaster is so fashioned and padded as to hold it as nearly as possible in contact with its fellow. A posterior support or splint is then applied and secured with a plaster-of-Paris bandage. The final step consists in drawing together the fragments of the patella as firmly as possible, either with adhesive strips obliquely applied or by means of a knee-cap suitably constructed.

After the apparatus is comfortably in position the patient is permitted to walk about with the aid of crutches, the limb being kept in an advanced position however by a sling carried beneath the sole of the foot and around the neck of the patient.

## THE TREATMENT OF ABDOMINAL INJURIES WITHOUT EXTERNAL WOUNDS.

In reference to injuries of the kidney, BRYANT (*The Lancet*, Jan. 11, 1896) says that crushed kidneys rarely require surgical interference, as they recover of themselves. In injuries of the intestines, however, the case is entirely different; a ruptured intestine is probably present, though this is not certain, when, after a diffuse injury to the abdomen or a severe local injury, as the immediate result of the accident there is little collapse, and where vomiting soon becomes a prominent and persistent symptom, with lasting local pain and great thirst, with or without abdominal enlargement. The author's notes of nineteen cases of rupture of the intestine confirm the truth of this statement.

With the presence of these symptoms, therefore, in any case of abdominal injury brought about by forces which are likely to have produced such a rupture, and particularly if they have persisted for eight or ten hours and collapse has not been present, or, if present at first, has passed away, Bryant would hold any practitioner free from blame if he suggested and caused to be carried out what is called a laparotomy—that is, an exploratory abdominal incision—with the view of searching for and uniting a ruptured bowel if found to be present, or of arresting bleeding and giving a chance of life to a young subject or strong middle-aged man. But this measure, to prove successful, must be undertaken early—that is, not later than twenty-four hours after the receipt of the injury, and earlier if possible—for it seems that death within thirty-six or forty-eight hours of the accident is the rule, whilst some die earlier and a few later; but it is clear that the earlier the operation is performed the greater may be the chance of success. In old or feeble subjects such a measure is, however, out of the question, but in young people and healthy subjects it ought to be undertaken.

## SURGICAL TREATMENT OF CANCER OF THE PYLORUS.

QUENU (*Rev. de Chir*, 1895, No. 10) reports two interesting cases which he believes prove that pylorectomy is a justifiable operation even in cases in which relapse is certain or nearly so, and that in all cases a gastro-enterostomy will give great relief from troublesome symptoms, while, at the same time, it builds the patient up, increases the vitality, and renders what remains of life more agreeable. In one case reported, although death from recurrence occurred one year after the pylorectomy, the patient during that time was entirely relieved from pain, vomiting, and many other unpleasant symptoms, and regained flesh and strength. Quenu believes also that an exploratory incision is justified by the presence of an induration in the gastric region accompanied by dyspeptic symptoms.

If the exploratory operation shows a non-operable cancer of the pylorus, either too diffuse or that has already involved too many lymphatics or is too adherent, he advises the performance, as a palliative measure, of a gastro-enterostomy by means of Murphy's button.

If the cancer is operable, he advises a gastro-enterostomy, to be followed, eight or ten days later, by a pylorectomy.

The performance of the operation in two stages he believes has the advantage of greater rapidity in the pylorectomy, and the chance to build the patient up between the operations.

## COLOTOMY AND CONDITIONS REQUIRING SUCH OPERATION.

WHEELER (*Dublin Med Journ.*, January, 1896) describes his method of operating as follows: In inguinal colotomy a short perpendicular incision about three inches long is made external to the epigastric artery in the groin. As soon as the peritoneum is opened the omentum generally appears, the peritoneal wound may be enlarged, and the divided peritoneum is sutured to the skin by carbolized silk—this lessens the risk of oozing from the cut surfaces entering the peritoneal cavity. The sponge previously placed in the peritoneal cavity is now removed and the sigmoid flexure presents; if not, it may be found by tracing from the descending colon down or from the rectum up, or by passing the finger in upon the iliacus muscle; the large intestine may be felt.

The gut having been brought through the wound, a sufficient portion of intestine with a moderately long mesentery is obtained. A silk ligature is passed through the mesentery, and it is sutured to the parietal peritoneum on each side, taking care that the gut is well protruding. In cases of a moderately long mesentery, indeed in all cases in which there is sufficient mesentery to admit of a good span, he also sutures the mesentery to the parietal peritoneum, about two inches from the protruded portion of gut at the lower or distal end. This is a most important step to prevent subsequent procidentia. Two or three points of suture passed through the serous and muscular coats of the intestine and the edge of the parietal peritoneum, where it joins the skin, complete the operation. After ten to twelve hours the gut becomes adherent and may be opened when it is indicated, but this need not be done for two or three days if the patient is comfortable.

## DERMATOLOGY.

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### Eruptions of Palustral Origin.

Brocq reports (*Annales de Dermatologie et de Syphiligraphie*, 1896, No. 1) an extremely interesting case of circumscribed eczema-form eruption due to malarial poisoning. The patient was a woman, about forty years of age, apparently in good health, who had already been under treatment several times for a rebellious eczema of the hand two or three years previously. Upon the end of the nose, on the left side, was a small eruptive plaque of irregular contour, but oval in its general aspect, about a centimetre high and a centimetre and a half in its transverse diameter. The base was red, slightly swollen, and congested; upon its surface were papulo-vesicles, seven or eight in number, grayish-yellow, and slightly oozing. The sensation experienced by the patient was slight burning rather than itching. This sensation was most marked in the morning upon awakening and disappeared in the afternoon. The eruption had lasted about a month and had extended but little. No other eruption was present upon any other part of the body, the patient being completely cured of her eczema of the hands. The diagnosis was for a time in doubt, but close observation of the case showed that the eruptive plaque underwent quite regular variations: thus it enlarged some days before the menstrual period, becoming more swollen, red, and oozing. Every morning, upon awakening, the lesion was very much inflamed; a very abundant, transparent, serous liquid oozed from the vesicles. It was ordinarily about 4 or 5 o'clock in the morning that this congestive attack occurred; it was announced by a kind of localized fever, the patient experiencing throbbing and a sensation of tension and burning. These phenomena reached their maximum between 7 and 9 o'clock in the morning; then they gradually diminished in intensity. About 2 o'clock in the afternoon the oozing ceased and the turgescence disappeared. By 6 o'clock the lesion was scarcely visible. Upon inquiry it was learned that, although the patient had never had a veritable intermittent fever, she had had diverse manifestations of paludism which had yielded only to quinine in large doses. She had lived for several years where intermittent fever was prevalent. In view of this history the patient was given hydrochlorate of quinine in daily doses of 80 centigrammes, the local treatment being limited to the application, in the morning, of poultices of potato starch, and in the afternoon to a simple ointment of oxide of zinc. The effect of the quinine was extraordinary; at the end of forty-eight hours the morning congestive attacks had ceased, the oozing stopped, and at the end of four days the lesion was no longer elevated and was undergoing resolution. After a time the patient ceased all treatment, when the eruption returned, but again yielded to quinine.'

From a study of this case the author concludes:

1. It should be placed among those dermatoses still badly known, which constitute the pure and true cutaneous form of masked paludism.
2. In the presence of a rebellious dermatosis, with unusual symptoms, one should think of the possibility of paludism.
3. Quinine and arsenic are in these cases the remedies.
4. The class of "paludides" timidly proposed by Verneuil and Merklen ought to be accepted.

## Pathology of Pigment-anomalies of the Skin.

Orlandi (*Monatshefte für Derm.*, Bd. xxii. No. 6) describes several cases, and makes the observation concerning the pathogenesis of these affections that they are connected with the sympathetic, not with the entire sympathetic, but with the fibres which are prominent in governing pigmentation. From the observation that vitiligo is incurable, and that chloasma on the other hand sometimes passes away spontaneously, the writer questions if there may not be an alteration of the involved sympathetic fibres in the former, and merely an irritation in the latter.

## Pityriasis Alba Atrophicans.

Krösing reports a case of this rare and curious affection (*Dermatologische Zeitschrift*, 1896, Bd. iii., Heft 1). The patient was a man, forty years of age, in good general health, without any history of any inherited tendency to cutaneous disease. The alterations in the skin occurred on both lower extremities and were the same on both sides. Around the ankles the skin was livid, thin, tightly stretched, and covered with variously sized, grayish-white, shining, for the most part firmly clinging, scales. Owing to the stretching of the skin the natural marking had disappeared and it was no longer possible to pinch it up in folds. The subcutaneous fat also seemed to be atrophied and the skin seemed to lie closely upon the tendons and the bone. Movements of pronation and supination of the foot were hindered in some degree by the tightness of the skin. The venous network was clearly visible through the thin skin. Upon the leg the scales were more delicate, thinner, bran-like, and less firmly adherent, so that they could be in great part wiped off with the hand. The muscles of the calf were also diminished in volume. In the hollow of the knee the skin was tightly stretched, so that extending of the leg was disagreeable. Upon the thigh the changes were less marked, since they were of more recent origin. On both sides the affection reached in front to the groin, behind to the lower border of the gluteal muscles. Sensibility, patellar reflex, and electrical excitability were norma. The disease had begun, when the patient was thirteen years of age, on the left ankle, with the appearance of a dry, scaling pale spot which burned slightly rather than itched. This spot had never been reddened, swollen, or moist nor had any other change in the skin—papules, vesicles—preceded the appearance of the scales. This dry scaling gradually extended over the whole lower extremity. The disease did not begin upon both extremities at the same time, the left one having been affected ten years before the right one. Histological examination of excised portions of the altered skin showed marked atrophy of all parts, but no evidences of inflammatory change.

## Tuberculosis of the Wrist Cured by Injections of Cantharidate of Potassa.

At a meeting of the Société Française de Dermatologie et de Syphiligraphie (*Annales de Dermatologie et de Syphiligraphie*, 1896, No. 1), **Branthomme** reported a case of cutaneous tuberculosis cured by this method. Upon the upper part of the right hand and the lower part of the wrist was a lesion the size of a five-franc piece, which had been treated by various means for fourteen months without result. Recourse was had to cantharidate of potassa, a solution of which, prepared according to the following formula, was injected hypodermically: Cantharidate of potassa, 0.001 gramme; hydrochlorate of cocaine, 0.10 gramme; distilled water, 10 litres. One cubic centimetre of this solution was given at each injection, and eight injections were given in a period of about three weeks. The injections were quite painful and one was followed by abscess. The first two were followed by elevation of temperature –39 3° C. and 39° C.—and local reaction which manifested itself by quite marked exudation. These phenomena did not appear at the third injection, at which time cicatrization began. At the time of the report cicatrization was complete.

## A Case of Rhinoscleroma Originating in the United States.

**Wende** reports (*Journal of Cutaneous and Genito-urinary Diseases*, March, 1896) a case of rhinoscleroma occurring in the person of a boy, eleven years of age, born in the United States, of American parents. The family history of the patient was good and he was apparently strong and robust. The disease had existed for a year and a half and was progressive in its nature. It began as a pink spot below the right naris and was free from pain. At the end of three months it was perceptibly elevated and developed into a pronounced ridge which gradually extended to the left side of the nose. The lesion was quite superficial, but the underlying tissue was infiltrated and very hard. Upon the right side of the nose were two sharply defined ridges measuring about an inch and three-quarters in length, having between them a small area of sound skin. Upon the left side of the nose was a single ridge having a uniform width of nearly half an inch. The right ala was uniformly thickened, causing a narrowing of the opening of the nostril. The result of the bacteriological examination was still in doubt at the time of the report.

## A Non-irritating Ophthalmic Ointment.

W. Allan Jamieson (*Brit. Journ. of Derm.*, April, 1896), after alluding to the difficulty of finding a perfectly bland ointment for the treatment of diseases of the eyelids, states he has found one of Unna's cold cream ointments, a little modified in proportions, to be an ideal ophthalmic salve. It is compounded as follows: Lanolin (Liebreich), ʒiij; ol. amygdalæ, aq. dest., āā ʒss.—M. To this may be added with advantage 2 grains of boric acid if the salve is intended to be kept for a long period. Patients express themselves pleased with the grateful sense of coolness, without smarting or irritation, which it imparts.

## Two Cases of Pruritus Cured by Antipyrine.

F. Arnstein and Atoniak (*Jour. des Mal. Cut. et Syph.*, Fév. 1896) report two chronic cases in which this drug acted happily. The first case occurred in a woman, twenty-eight years of age, the disease beginning upon the vulva, from which region it progressively extended over the thighs, abdomen, back, neck, chest, and upper extremities. There were no alterations in the texture of the skin. In the course of the fourth month of the disease antipyrine was taken twice daily, and at the end of ten days the pruritus had completely disappeared. The second case occurred in a woman aged sixty-six years, the subject of senile pruritus. Under moderate doses four times daily the disease entirely disappeared in two weeks.

## The Treatment of Trichophytic Onychomycosis.

At the séance of January 9, 1896, of the Société Française de Dermatologie et de Syphiligraphie (*Annales de Dermatologie et de Syphiligraphie*, 1896, No. 1) Sabouraud presented a patient in whom all the nails of the right hand were invaded by the trichophyton. The treatment consisted in the application of a permanent, moist iodated dressing, prepared according to the following formula: Metallic iodine, 1 gramme; iodide of potassium, 2 grammes; distilled water, 1 litre. A pad of absorbent cotton wet with this solution was applied to each finger, evaporation being prevented by means of rubber finger-stalls. After four months of treatment the nails appeared divided by a transverse line separating the old part of the nail-diseased from the new-sound part, showing that the growth of the fungus was arrested by the solution. The author believes this method of treatment superior to other methods.

## Bacteriological Investigation of a Case of Trichorrhexis Nodosa Barbæ.

Essen (*Archiv f. Dermatologie und Syphilis*, 1895, Bd. xxxiii. Heft 3) gives the following as the result of the investigation of a case of trichorrhexis nodosa of the beard:

1. A small, well-characterized bacillus was found almost constantly in all the diseased hairs.
2. This bacillus differed essentially from that described by Hodara as the "bacillus multiformis trichorrhexidis," and has not yet been described.

3. Upon normal hairs and in three cases of trichorrhexis capillitii this bacillus was not found.

4. Inoculations practised with pure cultures of this bacillus upon normal hairs of the beard lead to the development of a disease-picture identical with the original case.

5. Therefore it is in the highest degree probable that the bacillus in question can produce trichorrhexis nodosa ; but the final proof will only be afforded when the vitality of the inoculated bacillus in the secondarily produced trichorrhexis has been demonstrated.

### Effect of Carbolic Acid on Healthy Skin.

A. Frickenhaus (*Monatsh. für prak. Derm.*, Bd. xxii. No. 7) concludes, as a result of experimentation upon the human skin and that of rabbits, that liquefied carbolic acid produces upon normal human skin an eschar, which involves the epidermis, but hardly the true skin, extending down only to the border of the papillæ. The eschar occurs in the form of a dry gangrene like that of mummification, and leaves only a slightly or a not at all pigmented scar; the former when it occurs disappearing entirely in about three months. The process of healing is especially prompt upon hairy parts of the body. In practice carbolic acid should not be employed in cases in which it is desired to act upon the true skin. General intoxication is to be guarded against by not applying the agent to larger areas than a half to one dollar at one sitting. It is desirable to bring about healing by second rather than first intention, in order that a better scar may result, especially on the face.

## OTOLOGY.

UNDER THE CHARGE OF

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### Otitis Media in Infants.

Walb (*Archiv. f. Ohrenh.*, vol. xxxix.) has been making observations upon infants, in the children's clinic at Bonn, with a view to establishing a system of prophylaxis and form of treatment of suppuration of the middle ear in very young subjects. In order to promote the escape of pus from the ear he recommends inflation of the naso-pharynx. Regarding prophylaxis, in view of the danger of infection of the ear from the nose, he recommends "cleansing the nose as soon as possible after birth. This may be done by inflation, *one nostril being left open.* If infection of the ear is already suspected, inflation should be performed with both nostrils closed."

Respecting these very injudicious suggestions, Zaufal (*loc. cit.*) wisely remarked that "as the passages of the child from intrauterine to extra-uterine life is a normal physiological process, one may venture to suppose that nature has devised plans whereby this transition may ensue without injury to the child. If, therefore, larger quantities of mucus, etc., are then found in the nose of the child, it is fair to suppose that they will be removed by the establishment of respiration and the movements of sucking and swallowing, without the necessity of artificial help. Under ordinary circumstances, then, there would be no necessity of resorting to inflations. Furthermore, such inflations, even when practised with one open nostril and a small air-bag, are not without danger, because the capacious opening in the child's Eustachian tube favors the entrance of the aforesaid masses of mucus, etc., into the middle ear, which would produce just what it is desirable to avoid."

### Acute Otitis Media.

Beneficial results of careful antiseptic treatment of acute otitis media, after either spontaneous rupture or paracentesis of the membrana tympani, by means of a solution of carbolic acid in water (2 per cent.), or, still better, by means of drainage of the auditory canal by gentle packing with iodoform gauze, are shown by **MacCuen Smith** (*International Clinic*, 1895, vol. ii.). **Dench** (*Archives of Pediatrics*, 1895) advises the paracentesis of the membrana when leeches and dry heat fail; and **Pritchard** (*British Medical Journal*, 1895) considers syringing the acutely inflamed and running ear as dangerous. He drains with cyanide gauze and avoids syringing. These conservative methods are safe and generally efficient, while other methods, which include syringing, mopping, instillations of peroxide of hydrogen, and insufflation of boric acid, are provocative of secondary infection and mastoiditis.

### Purulent Leptomeningitis from Acute Otitis Media.

**Joel** (*Archiv f. Ohrenh.*, vol. xxxix.) observed purulent leptomeningitis following acute otitis media with mastoiditis after measles in a child three years old. The post-mortem examination revealed no caries on the inner surface of the petrous bone, but pus was found filling the porus acusticus internus, and it was suggested that this pus may have found its way to this point from the middle ear through the facial canal.

**Brieger** (*Ibid.*) has suggested puncturing the cerebro-spinal space in order to decide whether, in addition to a brain-abscess, there is present also a complicating meningitis. The result is sometimes negative, though a meningitis be present. However, even in such cases Brieger concludes the surgeon may sooner decide to operate.

### Otitic Facial Paralysis.

Facial paralysis of the so-called rheumatic variety generally will be found at least associated with acute otitis media, if not caused by it, as shown by **Gelle** (*Annales des mal. de l'Oreille*, etc., 1890), and **Lannois** (*Annales des mal. de l'Oreille*, etc., 1894), and recently illustrated by **Bundy** (*Philadelphia Polyclinic*, 1895).

**Voss** (*Archiv f. Ohrenh.*, vol. xxxix.) claims to have relieved facial paralysis resulting from acute otitis media in a child, and which had lasted three months after all ear-symptoms had subsided, by opening the mastoid and cleaning out the hyperæmic, spongy tissue from the antrum. All other treatment had failed to give relief.

### HEMORRHAGIC EXUDATION IN THE MIDDLE EAR.

HAUG (*Archiv f. Ohrenheilkunde,* vol. xxxix.) reports the occurrence of hemorrhagic exudation in the drum-cavity as well as a simultaneous hemorrhagic otitis externa from irritation from a pulpitis in a molar tooth. In such a case the otitis may have been produced by putting some form of irritant into the external ear to cure toothache, a popular method in Germany.

### CARTILAGINOUS EXOSTOSIS IN THE EXTERNAL EAR.

J. ORNE GREEN records the observation and removal of a cartilaginous exostosis in and from the meatus. The growth had its attachment by an osseous pedicle to the attic of the tympanum. After detachment of the auricle from the bony meatus the new growth was seized by toothed forceps and extracted. Under antiseptic treatment of the ear (bichloride solution 1 : 5000) suppuration ceased in the course of a month, and in three months from the time of the operation the ear had became normal in all respects.—*Transactions of the American Otological Society,* vol. vi. part ii.

### EARACHE FROM DENTAL IRRITATION.

BARCLAY calls attention to earache from dental irritation in large children and adults. In all cases of earache in which the tissues of the ear appear normal oral irritation should be sought for and removed if found.—*Courier of Medicine,* September, 1895.

### ACUTE MASTOIDITIS FOLLOWING ACUTE OTITIS MEDIA.

HOLT reports two cases of acute mastoiditis following, in the course of four or five weeks, acute otitis media (*Transactions of American Otological Society,* vol. vi. part ii). Both cases resulted fatally from intracranial lesions. We can but repeat that acute mastoiditis in such instances must be regarded as an entirely unnecessary result of acute otitis media. The only possible explanation of its occurrence, which seems to be on the increase, lies in the septic retention in the drum and secondary infection of the antrum and mastoid, induced by excessive and irritant treatment of the ear and nasopharynx, generally carried out before the aurist is consulted.

### CIRCUMSCRIBED PERIPHLEBITIS OF THE JUGULAR DUE TO MASTOIDITIS.

J. ORNE GREEN (*Transactions American Otological Society,* vol. vi. part ii.) reports the occurrence of circumscribed periphlebitis of the jugular due to mastoiditis in a man of twenty-eight. The patient had been attacked with acute otitis media in the right ear five weeks before he was examined by Green, who thinks " the series of pathological processes were as follows : Suppuration of the tympanum and mastoiditis, periphlebitis (circumscribed pachymeningitis externa) of the lateral sinus, an extension of the periphlebitis down the jugular vein, and finally circumscribed suppuration within the sheath of the vein, at the seat of the operation (performed by Dr. George W. Gay), some three inches below the ear."

Before the operation for relief of the periphlebitis, by which a little pus was found in the sheath of the vein, Dr. Green had opened the mastoid antrum without relief. After the operation on the vein the patient rapidly recovered.

It is not stated in the history of this case what had been done for the ear by the patient, his friends, or his physician, in the five weeks before he was examined by Dr. Green. Hence there exists a most important hiatus in our knowledge of the probable etiology of the acute mastoiditis and its periphlebitic sequelæ. We feel safe in placing it, however, in the category of cases artificially produced by excessive, irritant, and septic treatment of the primary acute otitis media.

### PREVENTION OF MASTOID DISEASE.

Under the above title, BURNETT (*Transactions of the American Otological Society*, vol. vi. part ii.) maintains that acute mastoiditis is an entirely unnecessary result of acute otitis media, and never occurs except as a consequence of improper treatment of the primary acute inflammation of the middle ear and the nasopharynx, usually inflamed at the same time. The treatment of an acute otitis, he claims, should be largely negative, especially after discharge sets in, as the result of either paracentesis or spontaneous rupture of the membrana tympani.

This view is based on the fact that the acute otitis media is due to the presence of a pathogenic germ, generally the streptococcus, in the middle ear, whither it has gone from the nasopharynx.[1] Inflation of the nasopharynx under such conditions tends not only to drive more such germs into the middle ear, but the germs already there into the mastoid cavity. Inflation of the nasopharynx also tends to force pathogenic germs into the unaffected ear, if there be such, and set up inflammation there.

To relieve earache in acute otitis media a few drops, warmed, of a solution of carbolic acid (1–40) may be applied to the canal and membrana tympani if it can be borne. Dry heat over and about the auricle, however, is often sufficient to give relief, and *it never irritates*. Leeching, counter-irritation, and all forms of anodyne-drops are not only useless, but further irritate, cause artificial inflammation in the canal and membrana, and *mask* the true state of affairs. If pain in the ear continues and spontaneous rupture of the drum-membrane does not occur in from six to twelve hours, paracentesis of the membrana tympani should be performed. This should be preceded by the instillation of a few drops of an antiseptic solution into the auditory canal. Immediately after paracentesis or spontaneous rupture of the membrana *nothing* should be syringed, mopped, swabbed, or blown into the ear.

The auditory meatus should be stopped with antiseptic gauze—preferably iodoform- or carbolic-acid gauze—and let alone for twenty-four hours. The discharge which now sets in is beneficent and should be favored by the drainage obtainable with the gauze, as just stated. If any other procedure is adopted, staphylococci, ever present on the skin of all of us, are likely to get into the auditory canal, upon the membrana, through the perforations, and into the middle ear and mastoid cavities. Secondary infection is thus set up, chronicity is established, and the physician in charge of the case is confronted with the direful sequelæ named above. The occurrence of acute mastoiditis as a sequel of acute otitis media has been especially frequent since the introduction of hydrogen dinoxide into aural surgery. This can be explained by the expansive action of the drug named, which forces pus from the middle ear into the mastoid cavities.

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[1] Gradenigo and Pes, as reported in this JOURNAL, July, 1895.

BARCLAY (*Med. Review*, February 22, 1896) discards the use of *any form* of inflation in acute otitis media, as tending to increase the inflammation, and he urges all general practitioners not to permit its use among their patients.

BARR (*Internat. Otol. Congress; Annales des Mal. de l'Oreille*, etc., January, 1896) records a case of acute otitis media, complicated with mastoiditis, following the surgical removal of adenoids from the nasopharynx. He thinks this untoward sequel was largely due to the irrigations of the nasopharynx carried out both before and after the operation on the nose. Barr and Brieger (*loc. cit.*) both consider such irrigation unadvisable. In fact, this case reported by Barr furnishes another example of the danger to the ear attending violent measures of any kind in the nasopharynx. Much that is done there does no good to the nasopharynx, while harm accrues from it to the middle-ear.

## OBSTETRICS.

UNDER THE CHARGE OF

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### CÆSAREAN SECTION AFTER THE DELIVERY OF A MONSTROSITY.

In the *Centralblatt für Gynäkologie*, 1896, No. 12, ESSER reports the case of a multipara whose labor came on in the sixth month of pregnancy, and who failed to deliver herself. The head of the fœtus was presenting, and an effort to deliver with forceps resulted in separating the head from the body. The fœtus was greatly disorganized, and after the removal of the head it was impossible to make sufficient traction upon the arms to deliver the trunk. The body of the fœtus contained a tumor, of a semi-fluid nature, sufficiently great to prevent delivery through the pelvis. Fearing that the contents of this tumor might be infectious, and that if it were emptied by embryotomy it would infect the uterus, Esser delivered the patient by the Sänger-Cæsarean operation. The mother made a good recovery. An examination of the fœtal body showed the trunk greatly distended with a clear fluid, while the limbs were but rudimentary and were very small.

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### SIX SYMPHYSIOTOMIES.

In the *Annales de Gynékologie*, March, 1896, LEPAGE reports six symphysiotomies at the Maternity of the Hospital St. Louis, Paris.

The first was in the case of a woman, aged thirty-six years, whose first pregnancy ended spontaneously at term. She was found to have a small antero-posterior diameter, measuring between 8 and 9 cm. Labor delayed, although the head presented and the heart-sounds remained good. The membranes were ruptured, but still the head did not descend. Symphysiotomy was performed, and the child delivered by forceps. Both mother and child made a good recovery.

His second patient was aged thirty-six years, and had been previously four times pregnant. She had lost her children after difficult deliveries with forceps. The membranes had ruptured in the present labor. As descent did not occur, the forceps was tried and abandoned. Symphysiotomy was done› and the child delivered with forceps. A tear occurred at the right side of the vestibule which connected the vagina with the symphysiotomy wound. This was closed with catgut. This patient required catheterization, but otherwise did well.

His third patient was in her second pregnancy, her first having been terminated by de Ribes by three applications of the forceps. As labor failed to progress, symphysiotomy was performed, and during the operation there was free hemorrhage, which was controlled by pressure. The child was expelled spontaneously. This patient made a good recovery.

The fourth case was that of a woman who had borne four children, two of whom had perished by difficult labor. In her present labor her physicians in attendance before she came to the hospital had made five attempts with forceps to extract the child. The pelvic floor and vagina were considerably bruised by the forceps. The patient's urine contained blood. Her temperature was slightly elevated, and a considerable tumor was upon the fœtal scalp. In view of the fact that the patient had borne children previously, an attempt was made to extract the child by the prehensile lever of Farabeuf; but this attempt failed, and symphysiotomy was necessary. Considerable hemorrhage occurred when the symphysis was opened. The extraction with forceps was difficult even after symphysiotomy, and a further examination disclosed the fact that the head was in brow-presentation. The child, however, was delivered, and suffered from facial paralysis of the left side. Its head showed the marks made by forceps-applications. A transverse laceration of the anterior vaginal wall took place near the clitoris; this was closed with catgut. The tissues about the urethra were very much bruised by attempts at delivery. Incontinence of urine developed, the patient passing urine into the vagina. The patient was subsequently examined by injecting a colored liquid into the bladder through a sound, when a vesico-uterine fistula was found connecting the bladder and the cervix. The patient complained of pain in the groin, but had no fever. The bladder was douched with boric acid, the general health of the patient remaining good. The fistula finally closed, and the patient made a good recovery. The child's facial paralysis had greatly diminished.

## THE RELATIONS OF PREGNANCY TO SURGERY.

This forms the topic of an address by MAYO ROBSON (*British Medical Journal*, 1896, No. 1841). As a general surgeon he has had occasion to operate eleven times upon pregnant patients. One of his cases was that of a myoma of the cervix, growing from the anterior lip, and occasioning an offensive and bloody vaginal discharge. The tumor was enucleated, the patient making a good recovery and going to term, having finally a spontaneous labor. He also operated for cancer of the breast in the third month of pregnancy, completely removing the breast and axillary glands. The patient went to full term, and a year afterward had no return of the disease. He reports an ovariotomy in the tenth week of pregnancy, with the removal of a rapidly growing tumor which was adherent to the posterior wall of the uterus. This was found to originate from an ovarian tumor which had ruptured, its solid portion invading the surrounding tissues. This patient's pregnancy was not interrupted, and she made a good recovery.

He also operated upon a strangulated femoral hernia in the third month of pregnancy with complete success. Stercoraceous vomiting, which was present, entirely ceased, but the nausea of pregnancy continued.

In another case an ovarian tumor in a patient two months pregnant had rotated, twisting its pedicle. Peritonitis was beginning when operation was performed. This patient also recovered, and the pregnancy continued.

He also reports a case of very aggravated hemorrhoids in a patient four months pregnant. The sphincter was dilated and the hemorrhoids removed by cautery without the interruption of pregnancy, the patient making a good recovery.

Another case of cancer of the breast and axillary glands at the seventh month of pregnancy was operated upon by radical removal of the breast and glands. The result was entirely successful.

A patient in the eighth month of pregnancy sustained a compound comminuted fracture of the leg. Pregnancy was not interrupted, and the bone knit with a good result.

A patient six months pregnant was operated upon for gall-stones by cholecystotomy, and nine gall-stones were removed. The wound healed by first intention, but on the eighth day the patient became much excited from a noisy inmate of the ward, and premature labor occurred, from which she made a good recovery. An operation for hemorrhoids and fissure of the rectum was performed during the second month of pregnancy, with a successful result.

His list closes with the removal of an ovarian tumor in the third month of pregnancy, the result being entirely satisfactory.

This series of cases demonstrates the fact that pregnancy does not render impossible surgical procedures, if such be demanded to cure disease.

Robson also calls attention to cases of abdominal tumors sent to a surgeon for operation, often under a mistaken diagnosis. He has repeatedly found pregnancy to be the cause of the tumor. He is accustomed to examine every case of pelvic enlargement in women with the idea that pregnancy may be present. He also calls attention to the importance of early operation in ectopic gestation, and reports two cases in which bleeding was still going on when the diagnosis was made, both of these patients making good recoveries.

### A Case of Sacculated Dilatation of the Umbilical Vein.

In the *Annali di Ostetricia e Ginecologia*, 1896, No. 2, Vicarelli reports a rare case in which a sacculated dilatation of the umbilical vein, 9 cm. long and 5 broad, was found near the placenta; no adequate reason for this abnormality could be discovered.

### Laparotomy upon a Newborn Child for Umbilical Hernia.

In the *Centralblatt für Gynäkologie*, 1896, No. 13, Marjautschick reports the case of a newborn child in the clinic at Kiew, who was found to have an umbilical hernia as large as a good-sized apple. On the day following birth the child was anæsthetized by chloroform, and under antiseptic precautions the abdomen was opened, the amnion which had become hardened removed, and the umbilical vessels ligated and cut. The viscera were carried back into the abdomen, the borders of the hernial opening were freshened, and the peritoneum and abdominal wall sewn together. The operation consumed fifty-five minutes, and one drachm of chloroform was given. The child perished five days afterward. The writer draws the following conclusions: Where the defect in the abdominal wall is so great that there is danger of the stitches cutting or parting, or it is impossible to bring the edges together without operation, it should certainly be undertaken. With children who are strong enough to live, the radical operation is the better. When operation does not seem justifiable, the child must wear an antiseptic pad.

When the gap in the abdominal wall is small, it is better to treat the hernial tumor by ligation without operation. This is the wiser course also when it is impossible to reduce the hernia. The post-mortem examination upon the child showed the wound of operation to be firmly united. In several portions of the abdomen fibrin was found, in connection with a slightly purulent exudate.

### Supravaginal Hysterectomy during Pregnancy, for Intestinal Obstruction.

In the *Medical Press and Circular*, 1896, No. 2964, Elder describes the case of a patient who had suffered from constipation before her marriage. After she became pregnant her constipation was aggravated. When four months advanced in pregnancy she was taken with violent nausea, lasting for three days and nights, while for four days afterward it was almost impossible for her to take food. The matter vomited was at first bilious, and then thick and dirty-looking. Repeated injections failed to move the bowels until the seventh day, when a small movement occurred. The bowels moved afterward very rarely in spite of medicine. The patient lost flesh and became very sallow. On examining the abdomen a tumor extending from the pelvis to within an inch of the umbilicus could be felt with two portions extending upward on each side, irregular in shape, and composed of nodules. By vaginal examination a large, solid, pelvic mass was felt pressing the uterus to the left. Hysterectomy was performed by ligating the broad ligaments and removing the tubes and ovaries, when, on lifting up the uterus, a coil of small intestine was found firmly attached to its upper surface. The adhesions were freed and tied. The uterus was found to be the seat of a fibroid tumor; an elastic ligature was placed around the cervix, a circular incision made, and the tumor removed. The uterine arteries were tied, the edges of the stump sutured, and it was fixed in the lower angle of the wound. A drainage-tube was passed into Douglas's cul-de-sac. Some eight hours after operation, hemorrhage from the stump occurred, which was checked by pressure and solid perchloride of iron. The patient made a good recovery. The specimen was found a myomatous uterus containing a fœtus eight inches long.

## The Present Method of Teaching Obstetrics in London.

In the *Practitioner*, 1896, No. 4, **Herman** very justly considers the present method of teaching obstetrics in London as excessively faulty. This method consists in theoretical lectures given by a professor of obstetrics, while the students are sent into out-patient practice, where they are supposed to summon assistance from junior instructors, if complications arise. Herman rightly draws attention to the fact that good obstetric teaching is that which shows the students how to prevent complications in labor and disease afterward. The General Medical Council is about passing rules governing this matter, when it is evident that the present system can no longer continue. Herman states that obstetrics should be taught in lying-in hospitals, as medicine and surgery are taught in general hospitals, the teaching being clinical in character. Students are admitted to but one obstetric hospital in London. Herman is very positive in his belief that students should not be allowed, unattended by a qualified practitioner, to conduct cases of labor in out-patient practice.

The custom, so common in America, of sending under-graduates to attend labor-cases, has nothing to commend it. In many American cities it is illegal, and the student or the college is liable to prosecution for such an act. In New York City the best out-patient work in obstetrics is done by the assistance, not only of the student, but of competent instructors with the student. No physician or surgeon sends under-graduate students into the houses of out-patients to treat cases of illness, or to perform even minor operations. It is to be hoped that those who persist in the practice will be compelled to abandon it.

## Infantile Syphilis.

In the *Lancet*, 1896, No. 3789, **Coutts**, in the Hunterian lectures upon this subject, reviews the question of transmission of syphilis, and also what is known as syphilis by conception. He draws attention to the remarkable persistence of the power of syphilitic infection transmitted by the father to the child. Cases are reported in which transmission from parent to infant took place twenty years after the primary infection. He finds that maternal syphilis is more injurious to the infant than is paternal. He does not personally believe in what is known by the French as "syphilis by conception." He does not believe, however, that a mother may absorb from a syphilitic fœtus an antitoxin of syphilis which may render her practically immune to the disease.

## A New Indication for Hysterectomy during Pregnancy.

In the *Berliner klinische Wochenschrift*, 1896, No. 13, Abel reports the case of a multipara who was at the end of her second pregnancy. The amniotic liquid had escaped thirty-six hours before, and the patient had had strong pains which had gradually grown weak. On examination the external os could not be found. It was finally possible to ascertain the position of the cervix, in which it was hard to admit one finger. The head was presenting, and each pain forced it downward and backward against the vertebra. It did not, however, descend, and labor was evidently impossible. Five hours later the patient was taken to a hospital. Upon opening the abdomen the uterus was found adherent to the anterior abdominal wall. The womb was also attached to the anterior wall by a considerable area of adhesions. The uterus was opened, and the child extracted. The uterus was amputated. The patient made a good recovery.

## Retention of a Dead Fœtus of Three Months, with Induction of Labor by Salicylate of Soda.

In the *Archives de Gynécologie et de Tocologie*, 1896, No. 3, Vinay reports the case of a patient who suffered from ill-feeling, loss of appetite, and diarrhœa, with attacks of icterus. An examination of the uterus showed that it reached to the umbilicus, and that there were no signs that the fœtus was living. To empty the uterus the patient was given eighty grains of salicylate of sodium daily for four days. At the end of the fourth day labor came on, and the patient was delivered spontaneously.

## The Treatment of Puerperal Infection by Injections of Serum.

Barr and Tissier report (*L'Obstétrique*, 1896, No. 2) a number of cases of septic infection treated by injections of serum.

The first patient was aged twenty-one years, a primipara, who was taken with typical chill and fever the third day after delivery. Repeated injections of bichloride of mercury solution 1 : 6000, were made, and curetting was done twice without improvement. Accordingly 100 grammes of serum were injected, followed on the next day by 120. The patient's urine contained no albumin and gave no evidence of an increase in its toxic properties. The third injection of 120 grammes was made, and a fourth, fifth, and sixth in succession. Two hundred grammes were given three times, and this was again repeated because of no improvement. Twenty c.c. of rabbit-serum from an immunized animal were also used, and this injection was repeated in slightly less quantity. The patient, however, died, and the autopsy showed an abscess near the right kidney, with the veins about the uterus and ovaries infected. No bacteriological examination was made in the case.

The second case reported is that of a multipara who had eclampsia. The patient was very pale, and her urine contained an abundance of albumin. A portion of the placenta was found retained in the os. The uterus was explored with the hand, and a large mass of membranes, slightly fetid, was removed. The patient was in a very weak condition following the removal of the membranes. Fever and foul lochial discharge followed, which were treated by injections of iodine. Serum was also used by hypodermic injection, that being selected which was supposed to be efficient to immunize an animal of the same weight as the patient. A few days afterward inoculations were made from the vagina and cervix. Those taken from the vagina showed bacillus of the colon and some colonies of streptococci. The pus coming from the uterus contained very few streptococci, but an abundance of the colon-bacillus. Douches were suspended, and the patient treated by injections of serum. As the patient grew worse, the injections were resumed, and ice placed upon the abdomen. An examination made of the exudate in the vagina showed many streptococci present. Repeated intrauterine douches were given, and injections of serum were repeated. Some ten days afterward she had a sudden rise of temperature without apparent cause. Her elimination was greatly improved, and she finally made a recovery.

Case three was that of a patient delivered by a midwife and brought into the hospital in a septic condition. Portions of decomposed placenta were found in the uterus, and beginning pneumonia was present in the lung. Streptococci were found in the lochia from the vagina. Repeated injections of serum were made, resulting in a very slight improvement. The patient finally succumbed to prolonged high temperature. Upon autopsy pure cultures of streptococci were obtained from the peritoneal cavity. The ovaries and uterus showed no signs of infection.

Case four was that of a multipara under the care of a midwife who had ruptured the membranes and given ergot to hasten labor. The patient was brought in during labor, which terminated in the birth of a dead child. Very fetid lochia came from the uterus, the child being putrid. The patient had fever, foul lochia, in which were found cultures of the bacillus coli communis. Repeated examination of the discharge of the uterus showed the presence of streptococci. The patient's illness ended fatally.

Case five was that of a syphilitic woman who bore a macerated fœtus; who had fever, but recovered under the use of serum-injections.

The sixth case was that of a multigravida, brought in in labor, which terminated with natural delivery. On the fourth day symptoms of sepsis appeared, and various germs were found in the lochia. The patient was subsequently taken with pleurisy, from which she made a recovery. She received several injections of serum from horses' blood.

Case seven was that of a premature labor in a woman who had hip-joint disease. Her delivery was followed by fever, and infective germs were found in the lochia. Dilatation was hastened by artificial means, and a dead child was delivered with forceps. This patient also received several injections of horse's serum The uterus was curetted and drained with iodoform gauze.

The patient died, and pus was found about the neck of the uterus beneath the peritoneum. It contained an abundance of streptococci.

Case eight was one which recovered under this treatment. She had a flat pelvis, and her child was delivered by version, being stillborn. She was infected by streptococci, and was treated with horse's serum.

Case nine had been treated by a midwife, and was brought to the hospital in a septic condition. She made a recovery under serum-injections and intrauterine douches.

The tenth patient was delivered at seven months by a rapid and natural labor. She became infected with streptococci and finally perished. Evidences of infection were found in the pleura, in the peritoneum, in the liver and kidneys.

The eleventh patient had been delivered by a midwife and was brought to the hospital septic. She lived but a day or two, dying of peritonitis uninfluenced by injections of serum.

The twelfth patient was a multipara brought into the hospital with a dead child, which was delivered by craniotomy. She became infected, but made a prompt recovery, although streptococci and pneumococci were found in the lochia. She was treated with horse's serum three times.

The last case reported is that of a multipara whose membranes had ruptured prematurely, an arm having prolapsed and the child having died. The head was found partially presenting, and the patient was delivered with forceps. This patient had a cellulitis on the left side, and an abundance of albumin in the urine. She finally perished, the autopsy showing a small abscess at the side of the uterus. Streptococci and pus were found in the thrombi in the uterine vessels.

# GYNECOLOGY.

UNDER THE CHARGE OF

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## Fixation of the Prolapsed Ovary.

Saenger (*Centralblatt für Gynäkologie*, 1896, No. 9) reports two cases in which he practised "pelvic fixation" of the ovaries. With the patient in Trendelenburg's posture, ventro-fixation of the retro-displaced uterus was first practised. The prolapsed ovaries were attached to the pelvic brim in one case by passing two fine silk sutures through each mesosalpinx near the ampulla of the tube, and then through the parietal peritoneum just in front of the attachment of the ovarian ligament. In the other case after ventro-fixation the ovaries (previously freed from slight adhesions) were drawn upward, ignipuncture of several follicular cysts was performed, and the organs were then attached to the parietal peritoneum as before, except that the sutures were introduced around the infundibulo-pelvic ligament just behind the fimbria ovarica. In both instances all former painful symptoms were relieved, and the ovaries remained permanently in normal position. In the second case the patient had conceived, and was six months pregnant.

The operation is comparable with intraperitoneal shortening of the round ligaments, and, like the latter procedure, aims at restoring the displaced organs to their normal position without impairing their natural mobility. It is, of course, impossible to accomplish this fixation of prolapsed ovaries except by cœliotomy. It is intended merely as a supplement to other conservative work upon the uterus and ovaries.

### NEW METHOD OF VAGINAL FIXATION.

WERTHEIM (*Centrablatt für Gynäkologie*, 1896, No. 10) calls attention to the serious complications of pregnancy and labor after vagino-fixations, where the normal enlargement of the uterus is interfered with. The same disturbances have been noted after ventro-fixation, though spontaneous delivery at full term occurred in about 85 per cent. of the cases collected by Miländer. The latter notes, however, that these were absent in all cases in which the round or broad ligaments were shortened or attached to the abdominal wall. It occurred to the writer that the evil results of vagino-fixation might be avoided by fastening the round ligaments to the anterior vaginal wall. The steps of the operation are as follows: The vesico-uterine pouch is incised transversely as widely as possible. The uterus is anteverted, the round ligaments exposed and a loop of each is pulled down, the cervix being drawn backward and the forefinger passed over the fundus. Counter-pressure above the symphysis assists in the anteversion and renders it unnecessary to seize the fundus with a volsella. The loops of ligaments can be drawn down and held with ligatures without bringing the uterus into the vagina. The ligaments can be secured intraperitoneally, when each loop is sutured to the outer angle of the vesico-uterine fold of peritoneum as the wound is closed. More permanent fixation, however, is obtained by attaching the ligaments to the corresponding angles of the vaginal wound, after which the peritoneum and vagina are closed separately. The immediate results of the operation are excellent, the uterus being in normal position, while the usual dislocation of the bladder is absent, since the fundus uteri does not rest upon it in such a way as to prevent its expansion. There is no danger of injuring the ureters. Since no cases of pregnancy after this operation have yet been reported, the crucial test of its value is wanting, but it seems fair to infer that the disturbances following Mackenrodt's method will be absent.

It is important to note that the ligament should not be seized directly at its origin, but at a point an inch beyond it. It is possible to draw out from three to five and one-half inches of the ligament, though an inch is sufficient in vagino-fixation. The writer further suggests that shortening of the round ligaments can also be readily performed in the same way by pulling them down from three to five inches and attaching the loops thus formed to their uterine origins. The uterus is thus elevated, as well as anteverted, precisely the same as in Alexander's operation. The vesico-uterine pouch is then closed, the bladder is re-attached to the cervix, and the vaginal wound is sutured. This procedure presents some advantages over vaginal fixation of the round ligaments, since the bladder remains in its normal position and relations, the ligaments can stretch in a natural way during pregnancy, and the uterus is not only anteverted, but is elevated in the pelvis. As compared with Alexander's operation, a single wound is made instead of two, there is no external scar, the ligaments are seen at their origin, where they can be easily identified, and the vaginal method is equally applicable to cases of retroflexion with fixation.

### Air-embolism during Myomectomy.

Biermer (*Ibid.*) reports the following case, which he regards as unique: During the removal of a myoma of medium size from the anterior aspect of the uterus a sudden hissing sound was heard as the growth was twisted out of its bed, and the cavity was filled with bloody foam. Less than two minutes afterward the patient ceased to breathe, her pulse became imperceptible, and although efforts at resuscitation were continued for an hour she expired. The diagnosis of chloroform-asphyxia was made, but at the autopsy the right ventricle was found to be distended with large air-bubbles.

### Gonorrhœa in Women from a Medico-legal Standpoint.

Neisser (*Centralblatt für Gynäkologie*, 1896, No. 14) discusses this important question with especial reference to the importance of the diagnosis, which, he affirms, cannot be positively made without the aid of the microscope. A secretion may be present which bears an exact resemblance, macroscopically, to gonorrhœal pus, but contains no cocci, or, in fact, any bacteria whatever.

Moreover, it is impossible to determine the time at which infection occurred, since its course differs so widely in different subjects. When the cervical canal is affected, but not the urethra, symptoms may be absent. The writer denies the truth of the statement that obscure acute gonorrhœal infection in the female may cause a chronic discharge in the male; the gonococci always possess the same virulence, and when they come in contact with healthy mucous membrane produce an acute inflammation. This explains the violent gonorrhœal attacks in newly married women, whose husbands regard themselves as entirely cured, and also the similar acute infection of men after intercourse with females whose physicians had discharged them as free from disease. In both instances the secretion is found to contain a few scattered cocci, which are only found after a long search. In the chronic cases the characteristic appearance of the gonococci within cells is often wanting, and the culture-test is frequently unsatisfactory. In short, the microscopical diagnosis is often exceedingly difficult. Still, this is the only one which should be admitted as positive in a court of law.

Simon (*Revue Méd. de l'Est; Annales des mal des Organes Gén-urinaires*, 1896, No. 4), after reviewing the opinions of various authors with regard to the importance from a medico-legal standpoint of the presence of gonococci in suspected vaginal discharges, the following interesting case is cited: A man, aged thirty-seven years, was accused of having committed rape upon a little girl, five years of age, and of having infected her with gonorrhœa An examination of the greenish pus which escaped from her vagina showed that it contained Neisser's cocci. The accused denied that he had had urethritis or any venereal trouble since an attack of clap fifteen years before, which had been promptly cured. Careful and repeated examinations of his urethra showed an entire absence of any abnormal secretion. A bacteriological examination of the urinary sediment demonstrated the presence of numerous epithelial cells containing bodies which somewhat resembled gonococci, but when subjected to staining by Gram's method failed to respond to the ordinary test. Under these circumstances it was impossible for the expert to submit a positive opinion. Hence the inference that when the question of the specific nature of an old urethral discharge is to be decided, too much reliance cannot be placed on the bacteriological evidence. Even when cocci are demonstrated in the vaginal secretion the origin of the infection, whether direct or accidental, may remain in doubt.

## Exploratory Cœliotomy.

Tilmann (*Deutsche med. Wochenschrift*, 1895, No. 49) calls attention to the fact that exploratory section is not entirely devoid of danger even with the exercise of the most rigid asepsis and careful suture of the abdominal wound.

It should be resorted to only after all other means of diagnosis have been exhausted ; in short, future advances in the diagnosis of abdominal affection should be made through the more careful study of symptoms and signs rather than by direct palpation through an incision. It is true that certain neoplasms are favorably affected by merely opening the peritoneal cavity (notably tubercular deposits), but this is only occasionally true of malignant disease.

## New Operation for Prolapsus Uteri.

Jacobs (*Centralblatt für Gynäkologie*, 1896, No. 15) describes the following operation, which he calls *callopexia ligamentaire*. It is applicable only in cases of women who have passed the climacteric and have been weakened by repeated pregnancies. After thorough disinfection of the vagina and curettage, the vagina is tamponed with gauze, and the abdomen is opened with the patient in Trendelenburg's posture. The uterus is amputated in the usual manner at a point just above the os internum, a deep wedge-shaped excision being practised, with anterior and posterior flaps. The cervical canal is cauterized with chloride of zinc, and the stump is sutured and covered with peritoneum in the ordinary way. Then (and this is the important step in the operation) the stump is elevated and attached to the upper stump of the broad ligament on either side, with silk sutures. In this way the prolapsed vaginal walls are drawn well upward. If the condition of the uterus is such that total extirpation seems to be preferable, the edge of the vagina can be sutured in a similar manner to the stumps of the ligaments.

[The criticism of this operation is that which we have already offered in the case of similar ingenious procedures advocated by our French *confrères ; i. e.*, it is rather heroic treatment of a condition not in itself serious or dangerous to life. The trend of opinion in this country is decidedly against the indiscriminate removal of the uterus except for actual disease of that organ. —H. C. C.]

### URETHRAL CALCULI IN THE FEMALE.

QUENU and PASTEAU (*Annales des Maladies des Organes Genito-urinaires*, 1896, No. 4) conclude a lengthy article on this subject as follows: 1. There is a well-marked clinical variety of calculi situated in the sacs within the urethro-vaginal septum, which communicate with the canal. 2. These are always formed directly from urinary deposits, either primarily or secondary to concretions in a urethrocele. 3. The diagnosis is easily made by direct exploration with the sound. 4. The surgical treatment consists in incision through the urethro-vaginal septum, removal of the stone, excision of the sac, and immediate suture.

# PÆDIATRICS.

UNDER THE CHARGE OF
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### THE SPLEEN IN TUBERCULOSIS OF CHILDHOOD.

MANICATIDE (*Revue Mensuelle des Maladies de l'Enfance*, February, 1896, p. 88) has examined the spleen in twelve cases of tuberculosis occurring in children. In ten cases tuberculous disease of the spleen was found, eight showing distinct macroscopic evidence of the disease, and the remaining two requiring microscopic examination to demonstrate its presence. Some of the cases examined presented a more or less generalized tuberculosis, but in several, in which the affection was of limited extent, the spleen was involved. Tuberculosis of the spleen is, therefore, much more frequent than is commonly believed.

In all the cases examined the spleen was increased in size, even when the evolution of the disease had been slow. This observation confirms the views of Landouzy and Henoch, who have always insisted upon the hypertrophy of the spleen in tuberculous children.

Histologically, if the evolution of the disease has been rapid, gray granulations predominate, with congestion of the organ; while if the evolution has been more slow and the child is of more advanced age, the tubercles are caseous, and the spleen sclerotic. In only one case was amyloid degeneration of the small vessels found. Giant cells are numerous, but the bacilli are not observed in any great number.

Contrary to the general conclusion of Bezançon (*Thèse de Paris*, 1895), tubercles do not always develop in the interior of the Malpighian corpuscles, but may be found quite often in the pulp, in the interstitial tissue, about the veins, and even in the capsule of the organ.

### Facial Herpes Secondary to Toothache.

George Carpenter, of London (*Pediatrics*, May 1, 1896) calls attention to a fact frequently observed by him, that herpes facialis may be due to irritation of the trifacial nerve reflexed from some dental affection. He suggests that facial herpes in the young should not be disposed of in an offhand way as only a "cold," for children suffering from toothache do not always complain of the teeth. Facial herpes, therefore, should be looked upon as possibly due to dental worry, and its cause at least be sought within the mouth.

### Leucocytosis in Diphtheria.

Schlesinger (*Archiv f. Kinderheilkunde*, 1896, Bd. xix. S. 378) has examined the blood in twenty-four children suffering from diphtheria, with a view to determining the effects of antitoxic serum. In twenty-one of these cases, when examined before the injections, he found a manifest hyperleucocytosis, the degree of which varied between 1 to 71 and 1 to 275. This leucocytosis was not in relation with either the age of the child or the elevation of temperature presented at the moment of the examination; the influence of the gravity of the affection upon the leucocytosis was not constant, but in general the degree of hyperleucocytosis was more marked the graver the case. It was also observed that hyperleucocytosis diminished as the case proceeded to recovery, but persisted in the cases terminating in death.

The influence of an injection of serum was manifested at first by a diminution of hyperleucocytosis, followed at the end of some time by an increase in the number of leucocytes, which did not always attain the degree observed before the injection.

### The Scorbutic Nature of Barlow's Disease.

An interesting contribution to the discussion whether Barlow's disease should be considered as allied to rachitis or scurvy—a question which the Germans seem not yet to have settled to their satisfaction—is furnished by a case reported by Freudenberg (*Archiv f. Kinderheilkunde*, Bd. xix. S. 217). An infant of nine months, nourished for the first three months upon the breast, and thereafter on sterilized milk, contracted pertussis from his brother, in the course of which ulceration of the gums, pseudo-paralysis of the limbs, and other evidences of Barlow's disease developed. Baginsky, who saw the child at this time, made the diagnosis of Barlow's disease, and ordered phosphorated cod-liver oil. This treatment having been continued without the slighest success for fifteen days, an antiscorbutic treatment was begun, with complete cure in fifteen days. This result of antiscorbutic treatment induces the author to decide that Barlow's disease is a manifestation of scurvy in the infant.

[This case adds another to the rapidly increasing number recently reported, which go to prove the influence of sterilization in the etiology of many cases of infantile scurvy.]

## DIAGNOSIS OF PULMONARY TUBERCULOSIS IN CHILDREN BY TUBERCULIN.

GAFFIÉ (*Thèse de Paris*, 1895) refers to the difficulties in an early diagnosis of pulmonary tuberculosis in the young, and after reviewing the various signs shows that none of them can be considered pathognomonic. Tuberculin alone, injected into the cellular tissue in dose of one-twentieth of a milligramme, gives a distinctive reaction in presence of tuberculous disease. In the twenty cases in which this injection had been made the reaction was mild and ephemeral, giving rise to no complication and occasioning only slight inconvenience, such as dryness of the mouth, headache, constriction of the chest, and redness of the face.

## ETIOLOGY OF PEMPHIGUS OF THE NEWBORN.

PETER (*Berliner klinische Wochenschrift*, 1896, No. 6) records a case of pemphigus in a newborn child whose mother was suffering from puerperal fever. A bacteriological examination of the contents of the blebs showed the presence of a diplococcus analogous to that described by Demme, and the staphylococcus aureus and albus. The same organisms were found in the milk of the mother and in the blood of the infant. The author, therefore, considers the pemphigus a result of infection through the milk.

## POST-MORTEM INTUSSUSCEPTION.

DR. JOHN RUHRAH (*Archives of Pediatrics*, April, 1896) reports that while making an autopsy on the body of a year-old infant twenty hours after death from endocarditis he observed numerous intussusceptions of the small intestine occur. On opening the belly the intestines had appeared normal, but five minutes later, while the thorax was being dissected, there occurred an intussusception of the ileum, the upper portion of the gut, about 6 cm. in length, being invaginated into the lower. On handling the intestines other portions of the ileum and jejunum started to invaginate themselves by what was apparently a reverse peristalsis. In a few minutes the entire small gut had become a mass of intussusceptions, varying in length from 5 to 10 centimetres. The number of separate invaginations was between twenty and thirty. It is stated that no solutions were used in or about the abdomen. [It would be of interest to know what medication had been given during the last days of life.]

## A STUDY OF TYPHOID FEVER IN CHILDHOOD.

JOHN LOVETT MORSE (*Boston Medical and Surgical Journal*, February 27, 1896, p. 205) has made a study of 284 cases of typhoid fever in children, based upon the records of cases admitted to the Boston City Hospital, from January 1, 1882, to January 1, 1895. A *résumé* of conclusions shows that the disease is rare under two years of age, but occurs about as frequently in children between five and ten as in those between ten and fifteen. The mortality in cases under fifteen is about 6 per cent., or half that in adults. The course is shorter and less severe than in adults; this, as well as the low mortality, being due to the slight intensity of the intestinal lesions. The onset is acute in about one-third of the cases in the second five years, and in about one-fifth of those in the third five years. Nose-bleed occurs in about 50 per cent. of all cases, and is often severe. The average duration of the fever is a little less than three weeks, being somewhat shorter in younger than in older children. The proportion of cases in which the duration is not more than ten days is twice as great in children under ten as in those over ten. The temperature-curve is less typical than in adults; the remittent second stage is absent in more than 50 per cent. of the cases under ten, and in 40 per cent. of those between ten and fifteen. Relapses are nearly as frequent in children as in adults and follow the same course. The tongue is rarely as dry as in adults. Vomiting is a common initial symptom; is not very infrequent, nor is it an unfavorable symptom, during the course. Constipation is more common than diarrhœa, especially in younger children. Distention is present in from 50 to 70 per cent. of all cases; and tenderness, rarely very marked, in about one-half. Hemorrhage is very rare under ten years, and much less common above that age than in adult life, being fatal in about half of the cases. Perforation is extremely uncommon. Rose-spots are present in from 60 to 70 per cent. of all cases. The spleen can be demonstrated clinically to be enlarged in from 80 to 90 per cent. Albuminuria is common, and occurs with equal frequency at all ages, but serious renal complications are rare, especially in young children. The pulse-rate, as usual in adults, is low in comparison with the temperature, 72 cases between five and ten showing an average range of from 93 to 124, and 185 cases from ten to fifteen giving 87 to 118.

## The Cardiac Hypertrophy of Growth.

Romme (*Revue Mensuelle des Maladies de l'Enfance*, April, 1896, p. 202) reviews the arguments for and against the existence of a cardiac hypertrophy due entirely to developmental changes associated with adolescence, as advanced in 1869 by Blache, and advocated more recently by Germain Sée. Romme confirms the conclusions of Potain and Vaquez, that when, during the period of growth, hypertrophy of the heart is encountered, the condition is due to some other cause than the mere growth of the body.

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# CASES ILLUSTRATIVE OF THE PRACTICAL APPLICATION OF THE RÖNTGEN RAYS IN SURGERY.

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The Röntgen method is, of course, in its infancy. It has, however, already reached a degree of usefulness that makes it obvious that the necessary apparatus will be an essential part of the surgical outfit of all hospitals and will be employed constantly in a variety of cases. Those to which the method can now be applied with advantage may be summarized as follows, emphasis being placed on the fact that what is written to-day may require revision or reversal to-morrow, so rapidly are improvements and discoveries taking place:

1. *Foreign bodies imbedded in any of the tissues of the body.* This is at once the most obvious and the simplest application of the skiagraph to surgery. Hundreds of cases have already been reported. Bullets, fragments of metal or of glass, needles, etc., are easily found, and, even if they are lodged in bone, the varying density of the shadows cast by substances of different permeability or of different chemical constitution will serve to define and locate them. It is desirable, if the foreign body be in a locality containing important surgical structures, that skiagraphs be made from at least two points of view, so that the depth from the surface and the exact relations of such body can be determined by measurement. A single skiagraph of a piece of steel in the arm, for example (Case X., Plate VIII.), taken from the front shows merely

its relation to the inner or outer edge of the arm, not at all its depth. A second view taken laterally would make the precise situation evident.

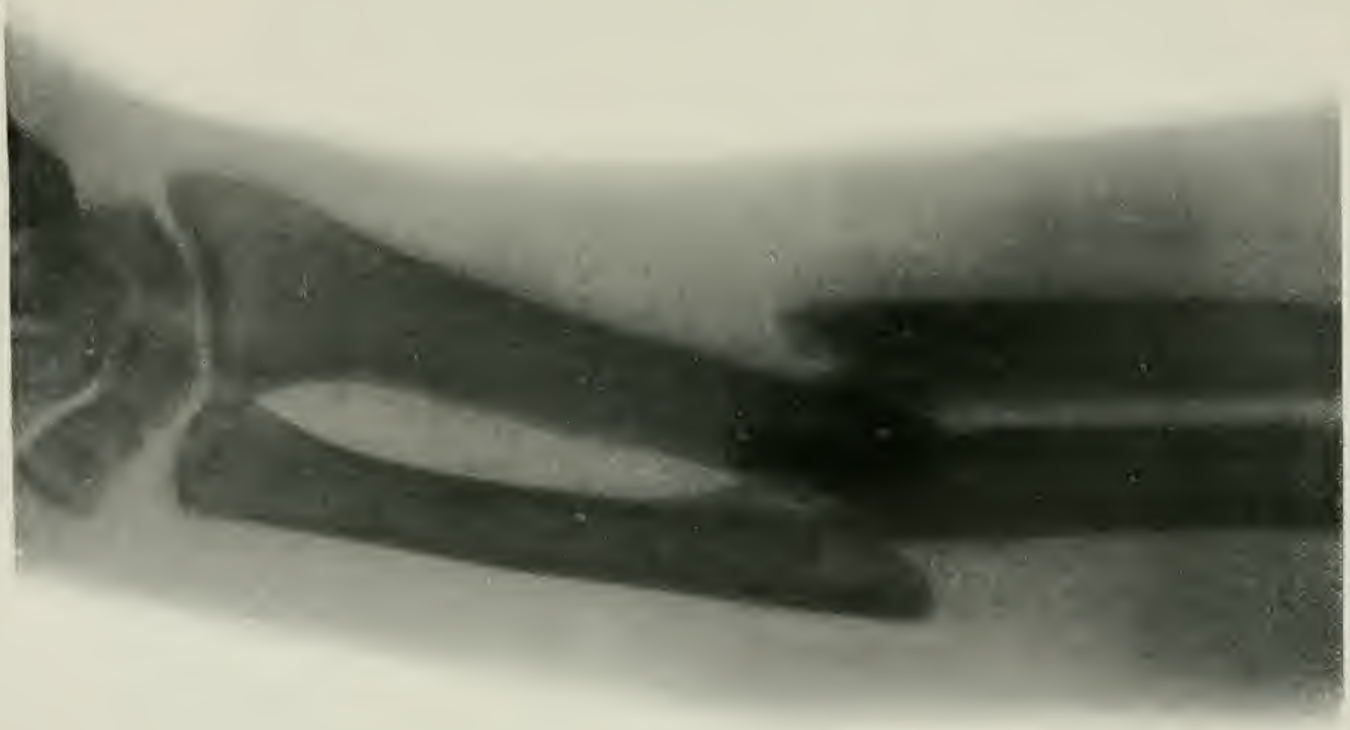
2. *Foreign bodies in certain of the organs and viscera* are likely to be discovered and located with a degree of accuracy that will vary with the region or structure involved and with the thickness of the enclosing tissue. Waggett and Rowland have shown (*British Medical Journal*, March 19, 1896) that a fish-bone and a small nail attached by plaster to the side of the neck in the position of the ventricle can be skiagraphed with ease. The larynx itself did not show at all, but by the aid of a chart of the region the exact position of a foreign body in the larynx ought to be easily determinable. It is obvious that extension of the method to the location of such bodies in the trachea, bronchi, and other portions of the air-passages is sure to come with further improvements in technique. In the digestive tract, except, perhaps, the first third of the œsophagus, the difficulties are greater; but the presence or absence of foreign bodies can doubtless be determined, although below the stomach it is questionable whether any definite information as to the exact situation can be obtained. In many cases, however, especially in children, it is a matter of grave doubt as to whether or not some foreign body has been swallowed. As the most uncertain cases occur in the youngest children, and as the ease of skiagraphy of the whole body is in direct proportion to the thinness and softness of the tissues, we may expect in just these cases to get the exact information which is so often lacking in the history given by anxious parents or nurses. Within the cranium neither experimental tests nor trials in actual cases have yet given any practical results in the discovery or location of foreign bodies, but there is every reason to believe that this will become possible in the near future.

3. *Foreign bodies formed within the organism itself* include chiefly gallstones and renal, vesical, and prostatic calculi.

Gallstones skiagraphed without the body cast very faint shadows; calculi of oxalate of lime, of phosphate of lime, and of triple phosphate cast shadows as dense as those of bone or metal; uric-acid calculi cast easily recognizable but somewhat fainter shadows (*British Medical Journal*, London, April 4, 1896).

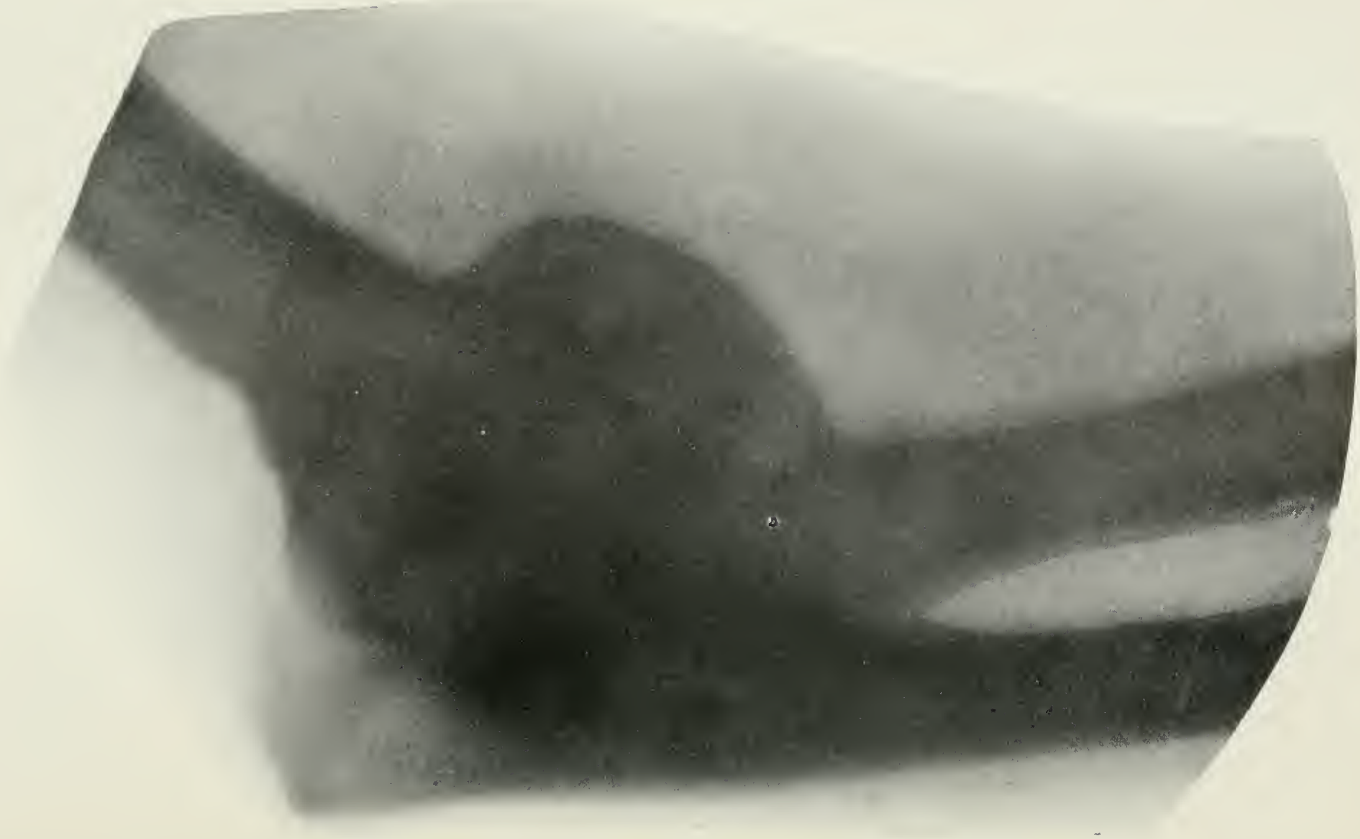
No practical results have yet been obtained in the discovery of these forms of calculi, but it seems within bounds to expect that after we become more familiar with the shadows cast by the normal viscera and the normal skeleton, we may be able to distinguish gallstones from malignant disease involving the ducts; may locate or exclude renal calculi in doubtful cases; and may see encysted vesical or prostatic calculi even through the shadows cast by the pelvic bones themselves. Many skiagraphs show in outline the shadow of one bone through the shadow of another (Case VI., Plate V.), and it is not improbable that after a time accurate diagnoses can be made in this manner. At present it is not possible.

PLATE I.



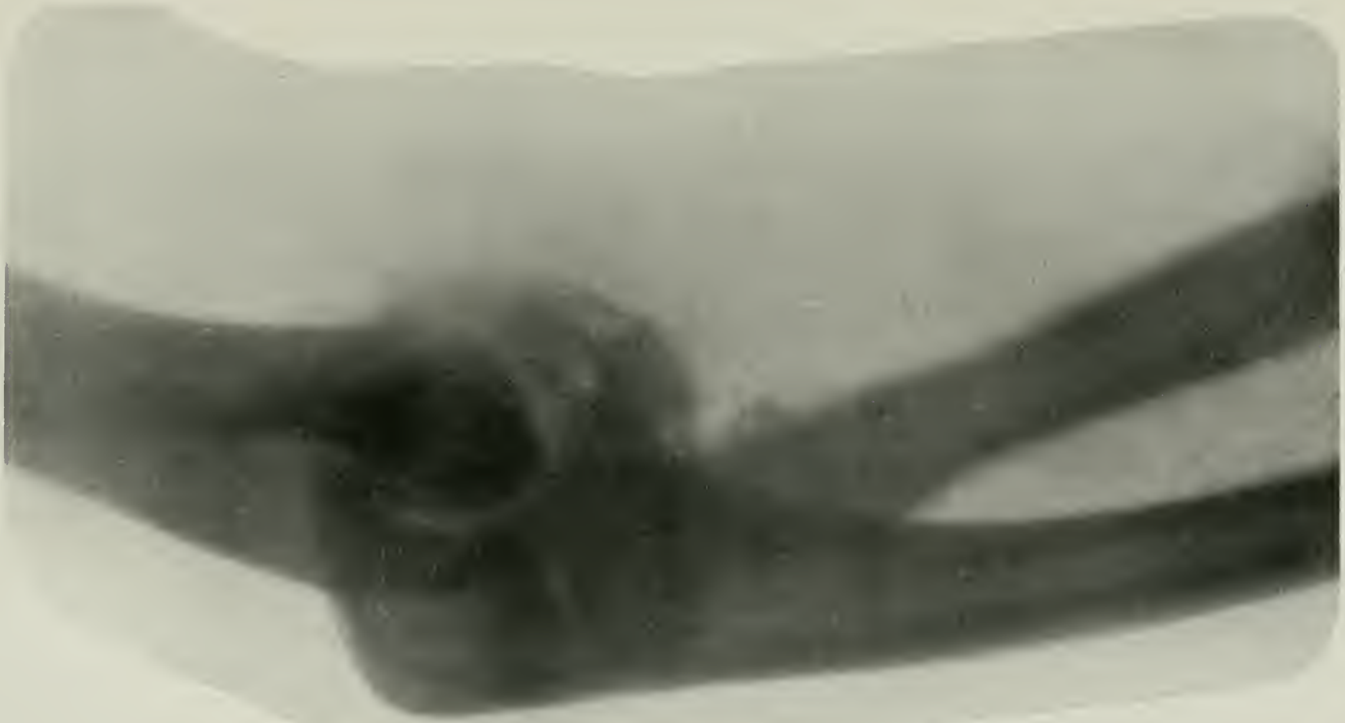
Case II. Ununited Fracture of Both Bones of the Forearm.

PLATE II.



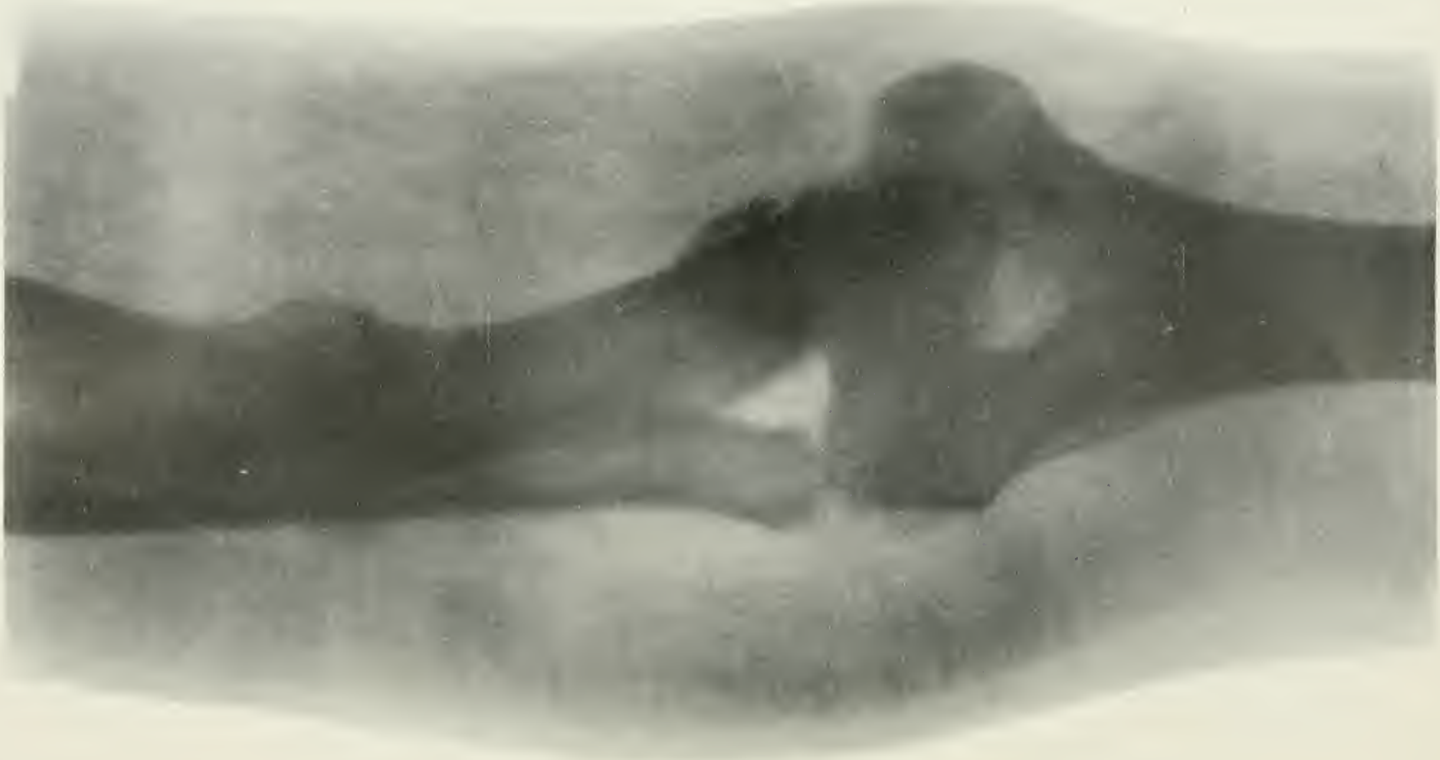
Case III. Dislocation of Both Bones of the Forearm Backward, with Ankylosis.

PLATE III.



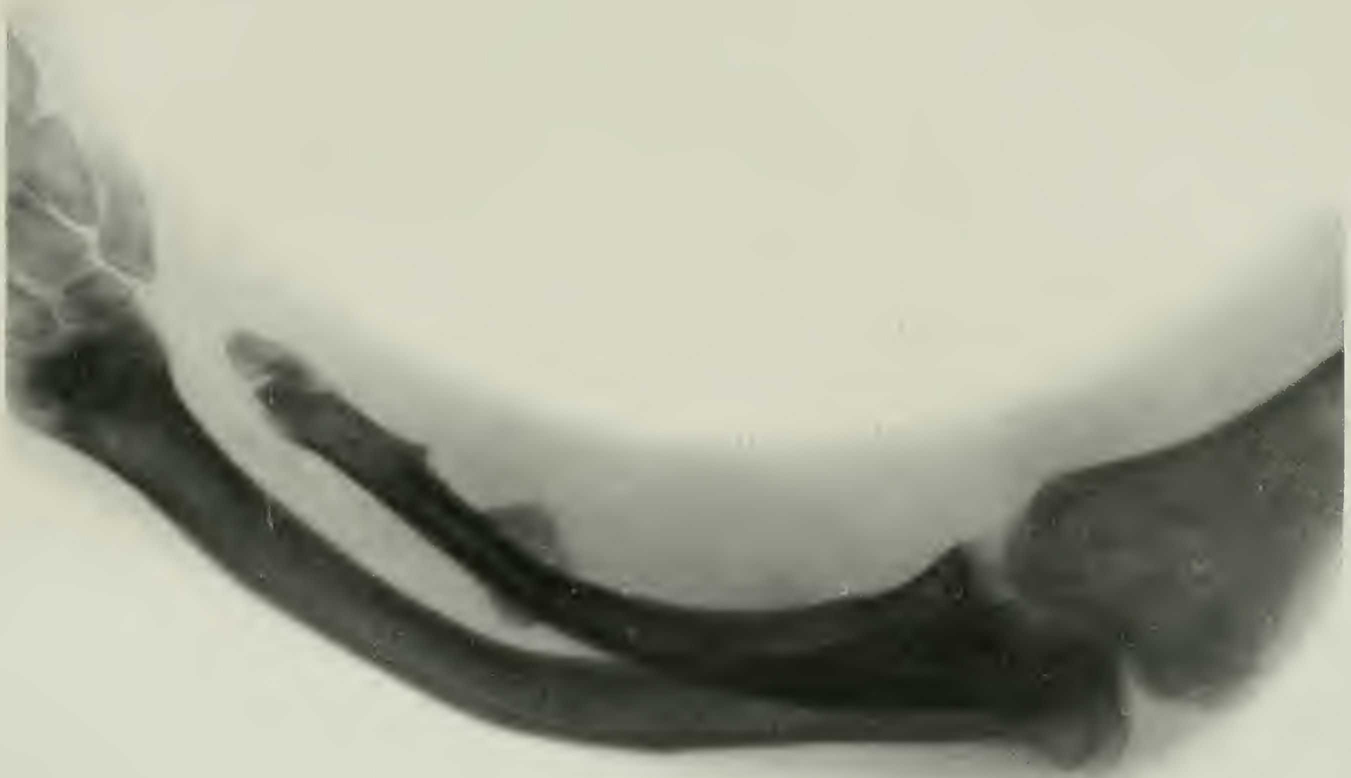
Case IV. Obscure Fracture Involving the Ulna and Humerus.

PLATE IV.



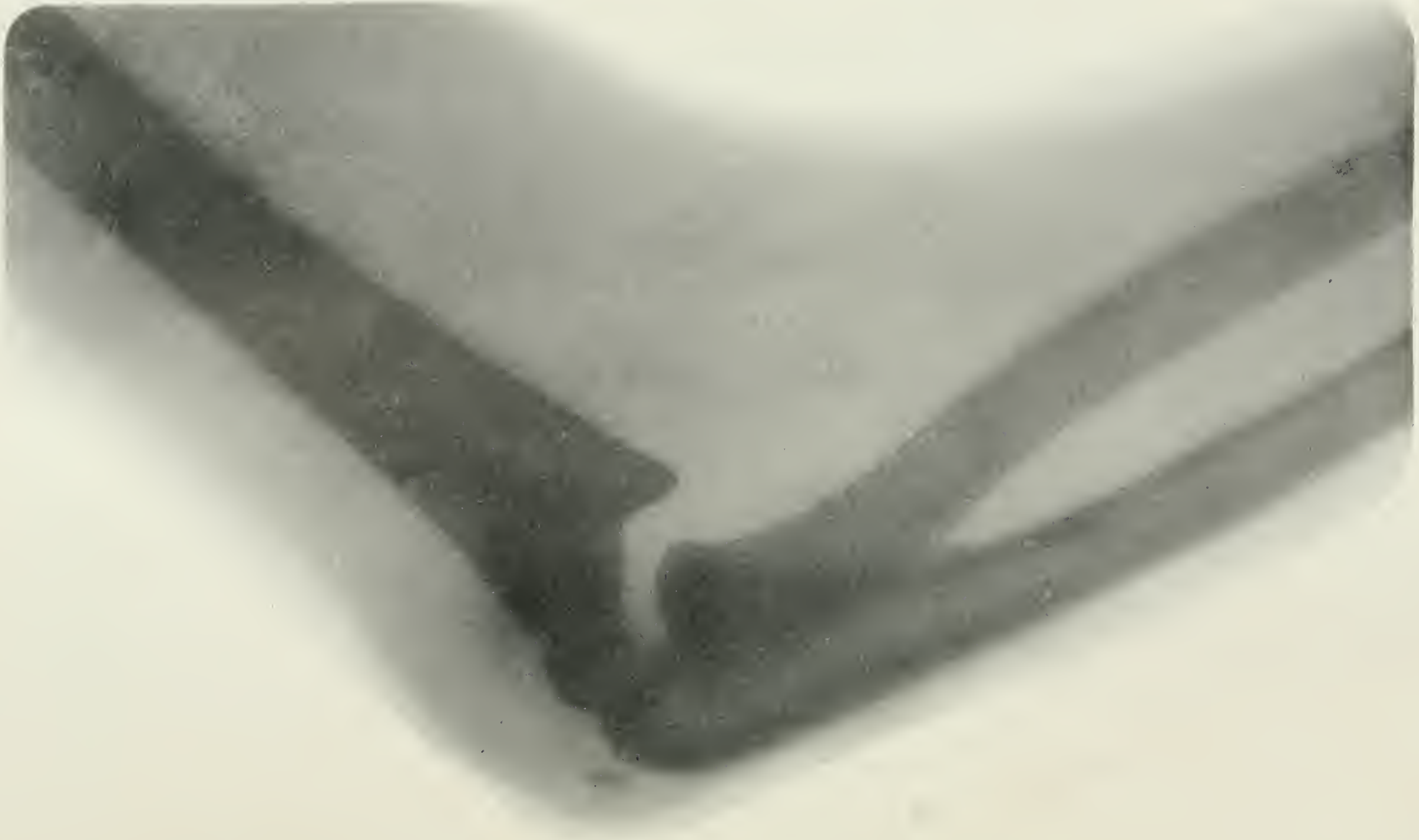
Case V. Excision of the Head of the Radius.

PLATE V.



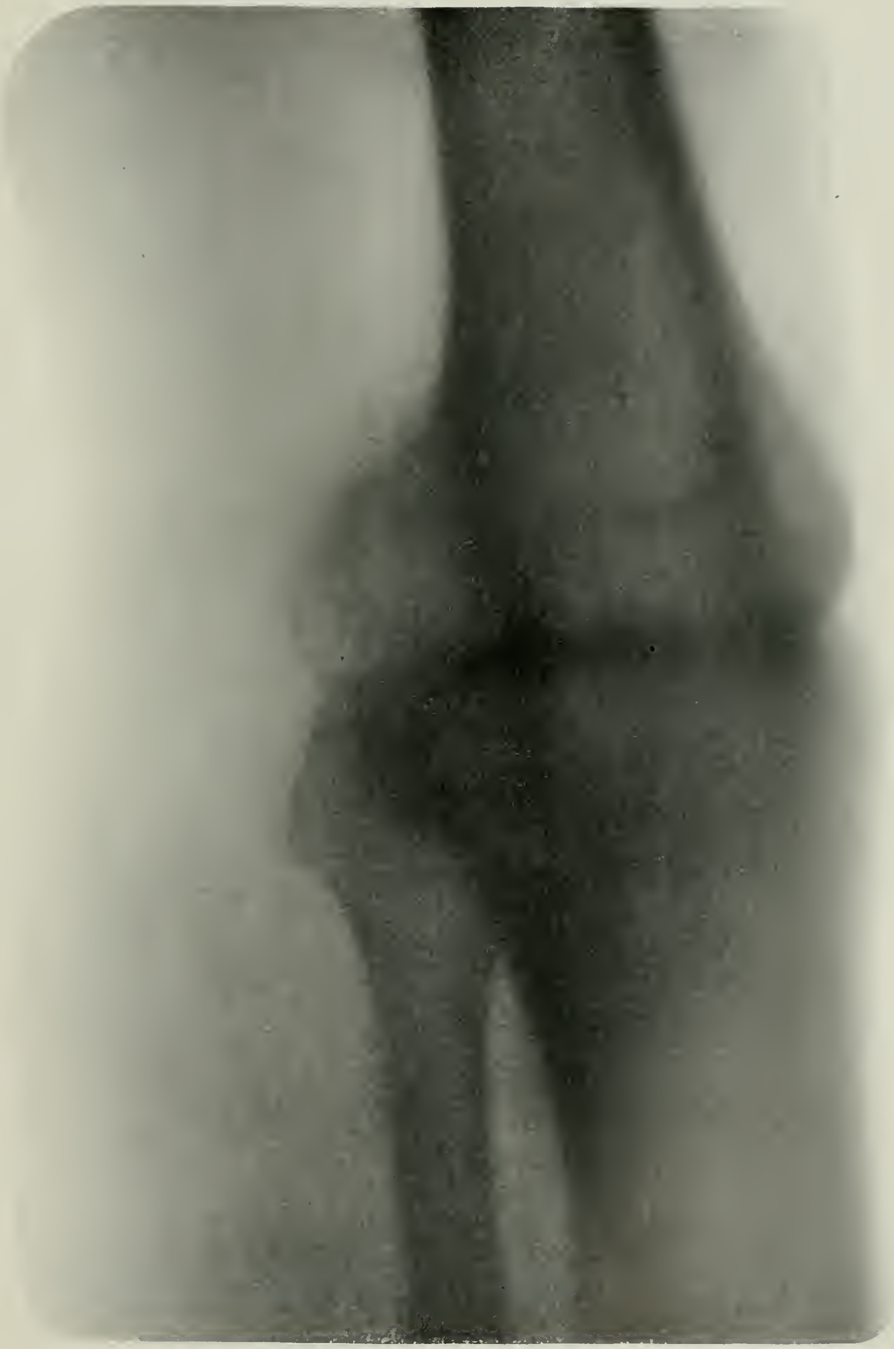
Case VI. Curvature of the Radius, due to Arrested Development of the Ulna at its Distal Epiphysis.

PLATE VI.



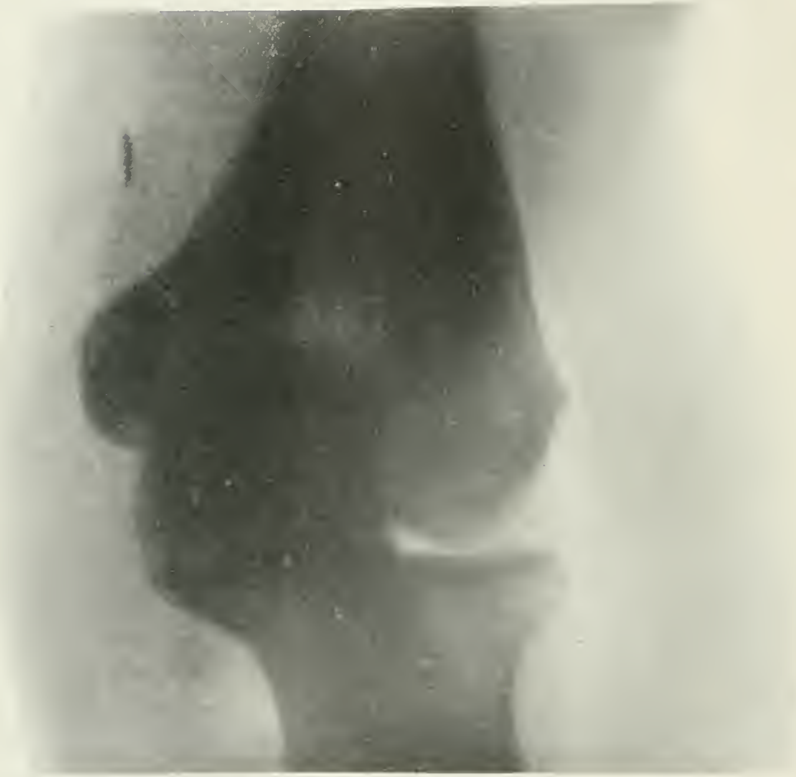
Case VII. Diastasis of the Distal Epiphysis of the Humerus.

## PLATE VII.



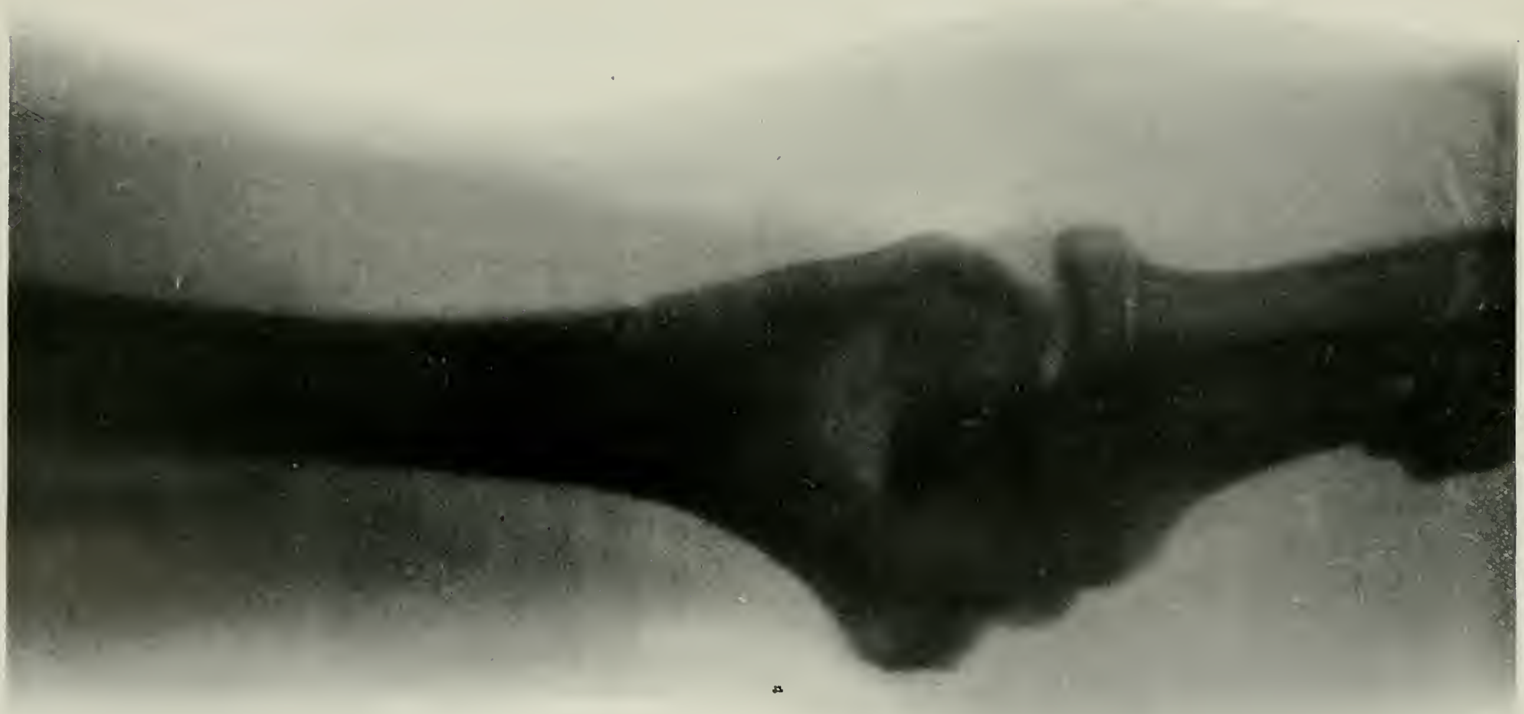
Case IX. The Results Obtained in Excision of the Knee.

PLATE VIII.



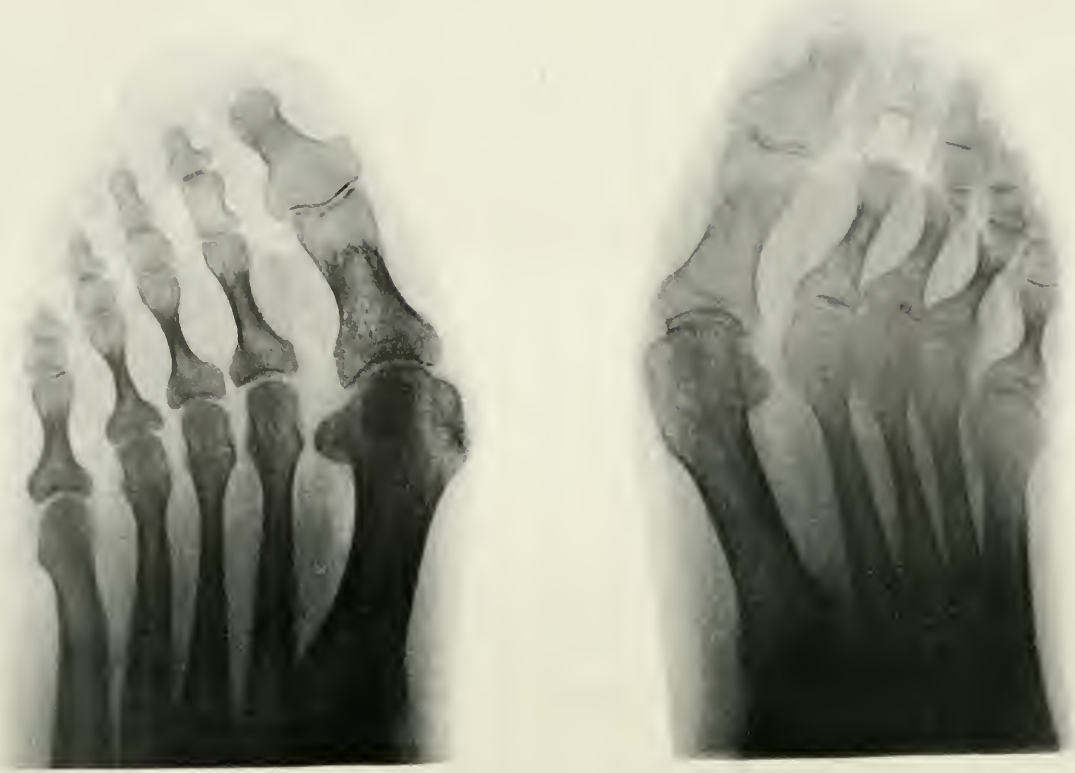
Case X. Foreign Body in the Arm.

PLATE IX.



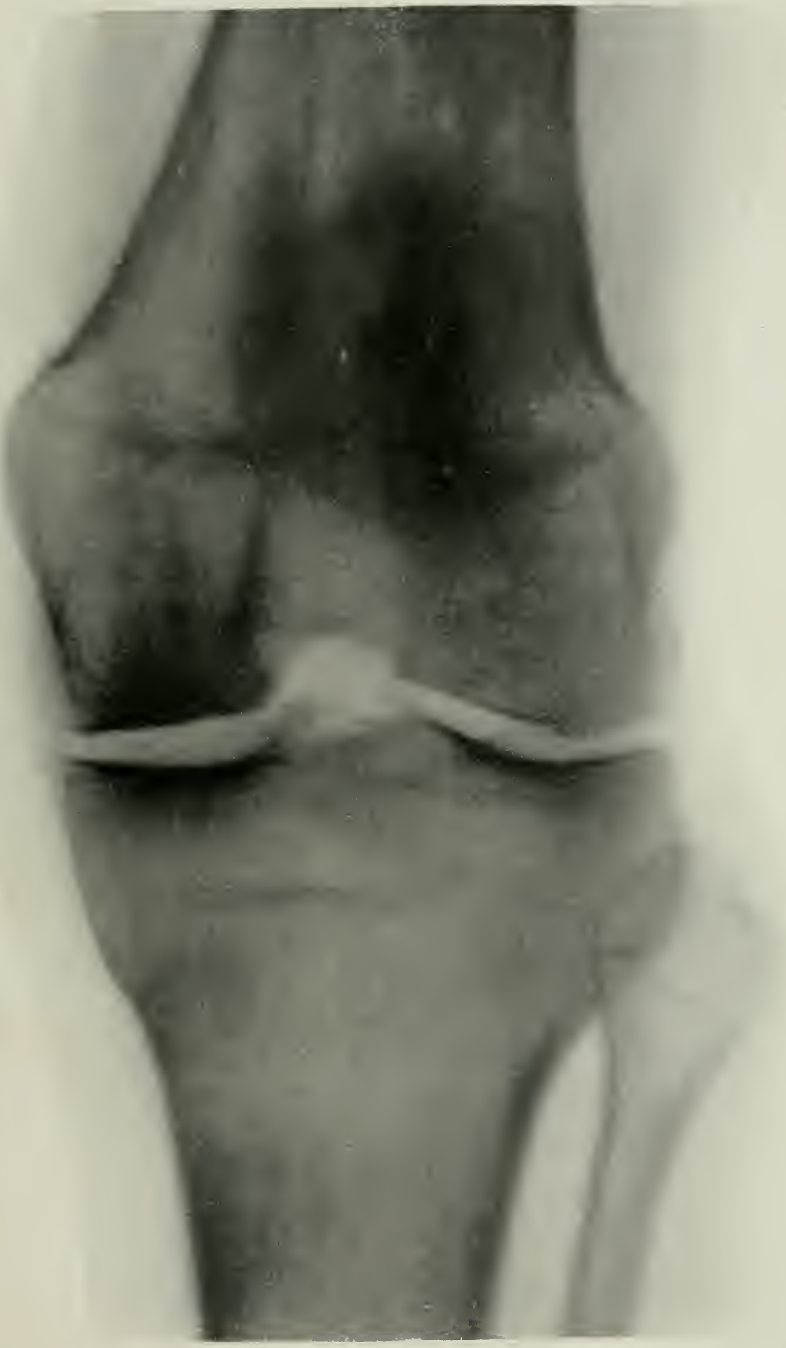
Case XI. Bullet in Forearm.

PLATE X.



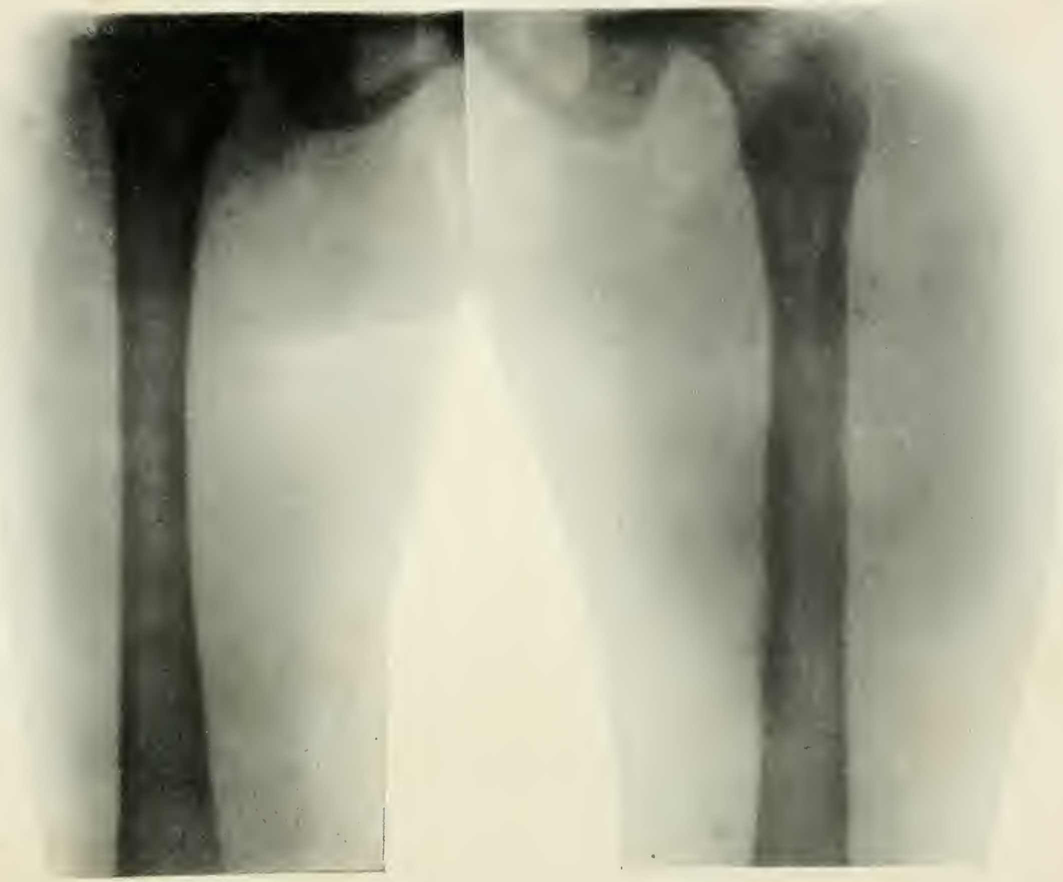
Case XII. Metatarsalgia.

PLATE XI.



Case XIII. Condensing Osteitis in Femur.

PLATE XII.



Case XIV. Subperiosteal Abscess of the Right Femur and Normal Left Femur.

4. *Inflammatory swellings and new growths* (except when bony) have not yet been shown to offer any special features diagnosticating them from normal structures. Bony tumors can plainly be seen, and as the method improves it is to be expected that intracranial and intraspinal osteomata may be discovered and located and possibly even periosteal thickenings due to tubercular, syphilitic, or pyogenic infection. Dead bone cannot as yet be distinguished from living bone, but it is reasonably certain that by greater perfection in detail we shall soon be able to outline the exact position and extent of a sequestrum, this again being made possible by the transparency of the bone-shadow itself; so that, for example, in a case of necrosis of the femur the shadow of that bone and the shadow of a sequestrum contained within it may be superimposed and plainly separable on the skiagraph. Abscess in bone can be made out perfectly.

Comparison of the normal limb with that which is the subject of tubercular or other chronic bone-disease will often reveal the full extent of the latter better than any method of exploration, and in a recent case led me to perform amputation through the hip-joint instead of through the upper third of the femur, the condition found abundantly justifying the procedure.

5. *Fractures and dislocations* at present offer the greatest field for the every-day use of the Röntgen method. It is impossible at this time to present exhaustively the conditions under which it should invariably be used, or to separate them from those in which it is a matter of interest rather than of necessity; but it is safe to say that it will be wise to employ it when possible.

*a*. In all fractures in or about joints either as a preliminary to the reduction of the deformity, or as evidence that such reduction has been accomplished. These fractures are, for unavoidable reasons, often followed by some limitation of motion and a more or less imperfect functional result. They have, therefore, on innumerable occasions been the basis for suits for malpractice. It will be both a satisfaction and a safeguard for the surgeon if he can see that his work has been accomplished properly and can retain definite evidence of that fact.

*b*. In doubtful cases or cases supposed to be of great rarity, it will be of inestimable value (Case VII., Plate VI.), both as aiding diagnosis and as demonstrating and recording the conditions present.

*c*. In cases of old injury in which, as so frequently happens, no reliable clinical history is obtainable and no accurate diagnosis can possibly be made by the ordinary methods. (Cases III., IV., and V., Plates II., III., and IV.)

*d*. In cases of ununited fracture, both to show the exact position and relation of the fragments prior to operation, the presence or absence of interposing structure, etc. (Case II., Plate I.), and also to show after operation the degree of efficiency of the wire, or of the peg or screw, or of the splint, or other retaining-apparatus. We may frequently determine in such cases whether or not open operation is needed, union often being obtainable, where the fragments can be brought into good position and nothing is interposed, by mere friction and the reapplication of the splint or other dressing.

6. In cases of *excision of joints* at the time when, for example, in the knee it is desirable to demonstrate that bony union has been obtained and in the elbow that it has been avoided. (Case IX., Plate VIII.) (Case V.)

7. In cases of *deformity* of all sorts affecting the bones, their epiphyses, or diaphyses, and requiring careful investigation before surgical interference is declined or advised. (Case VI., Plate V.)

8. In many *obscure cases* of the type of metatarsalgia, in which the demonstration of the cause of the nerve-pain and the indication for surgical treatment are equally clear and convincing. (Case XII.)

## ILLUSTRATIVE CASES.

I.—The patient, W. S., was admitted to the wards on January 23, 1896. Seventeen weeks previous to his admission he sustained a compound fracture of both bones of the right forearm. The flesh-wounds healed rapidly, but the bones remained ununited and at an angle, although they were treated by fixation in a plaster-dressing for some time.

The operation showed that the line of fracture was in the middle third of each bone. The extensor carpi radialis was found interposed between the fragments of the radius, where they overlapped one and one-half to two inches, effectually preventing any chance of union. The upper fragment was in extreme supination, while the lower was in extreme pronation.

The fragments of the ulna showed an attempt at the formation of a false joint, the proximal end of the lower fragment containing a cavity in which the distal end of the upper fragment was held. Great difficulty was experienced in getting anything like a proper approximation of the bones on account of the extreme rotation in opposite directions of the two fragments of the radius and because the interosseous space was more nearly obliterated between the lower fragments.

The resected ends of the bones were held in position by wire sutures and the flesh-wounds closed by interrupted sutures. The flesh-wounds healed rapidly, but bony union seems doubtful as yet. The skiagraph shows the position of the bones and the silver sutures in position, and illustrates the ability we now have, without disturbing the wound itself, or the limb, or even the dressings, to obtain accurate knowledge of the exact position of the bones after an operation of this character. Such information might be of the very highest practical importance. It might lead to a change of apparatus, to an alteration in the position of the limb, to a second operative attempt, etc., and it would almost certainly aid in giving definiteness to prognosis and in determining without undue motion of the part the final result as to the presence or absence of bony union.

II.—H. P., aged thirty-three years. On February 7, 1896, the patient was caught in the belt of a pulley and thrown down about six feet. He fell upon his left hand, bending it under him in extreme flexion. The patient was taken to a hospital, which he left seven weeks afterward without the consent of the attending surgeon. On admission to the University Hospital an ununited fracture was diagnosed, with the formation of callus and an attempt at union ; preternatural mobility was, however, marked.

The operation showed the condition to be exactly that seen in the skiagraph, the lines of fracture were as they are there shown ; a fibrous union existed between the distal end of the upper fragment of the ulna and the proximal end of the lower fragment of the radius. This attempt at union was broken up, and the ends of the fragments were freshened and united by drills, which were left *in situ*. The skiagraph was here of distinct assistance during the operation, enabling me to cut down upon and to remedy the deformity with the least possible disturbance of parts.

III.—C. R. L., aged thirty-six years, was admitted to the University Hospital March 31, 1896, with an ankylosis of the elbow. He gave the following history : In the latter part of January, 1895, he fell down stairs, striking on his elbow. The arm was dressed on a splint in full extension. This was continued for three weeks, when the arm was placed at an angle and dressed on a posterior moulded metal splint. After about four weeks passive motion was commenced, and a little later considerable force was used. The patient continued treatment for about three months longer and then stopped all treatment until he came to the hospital.

The diagnosis of dislocation of both bones of the elbow backward was easily made.

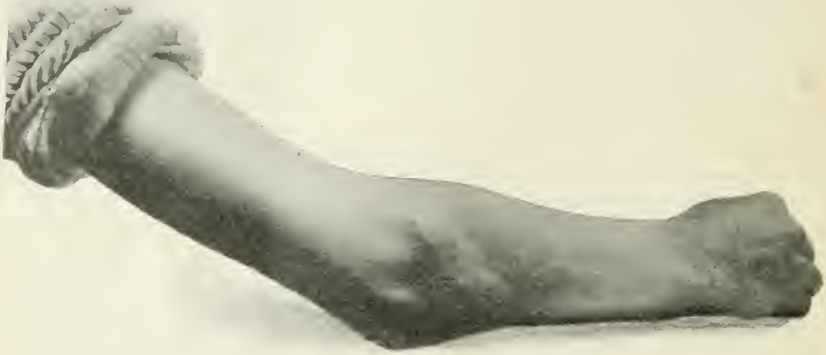
The skiagraph gave an apparently blurred and indefinite outline of the joint, which before operation seemed rather unsatisfactory. The operation, however, showed it to be exactly correct, the joint was dislocated, was ankylosed, and was surrounded by a large amount of dense callus, making excision of the joint with the arm in extension and fixed very difficult. The callus was exceedingly hard and united the olecranon process to the humerus. It was necessary to divide the olecranon and cut it free from the humerus with a chisel. The joint was cut part way through and then broken, thus permitting the completion of the excision.

There can be no doubt that as we acquire greater familiarity with this method we shall be able to recognize exact conditions as shown by different depths of shadow, etc., with much more accuracy. In this instance, for example, the facts were before me prior to the operation, but except that I saw that my diagnosis of backward luxation was confirmed, I got no help from the skiagraph. In future cases of the same sort I shall profit far more by the picture—at least to the extent of anticipating—and, when necessary, providing for the special difficulties of the case. This patient has recovered with a most useful and satisfactory arm.

IV.—F. McD., a carpenter, aged twenty-four years, fell from the roof of a house, a distance of forty-four feet, four years previous to his admission to the University Hospital.

There was a great amount of ecchymotic swelling; a fracture was diagnosed and the arm dressed in a posterior moulded felt splint. It was kept in this position for ten weeks; after this time the patient began by himself the use of passive motion, and succeeded in getting sufficient movement to enable him to pursue his occupation, although the arm was always tender, and cannot be flexed sufficiently for him to reach his mouth.

Two days before he presented himself at the hospital he heard, while at work, a loud snap which was followed by pain and increased disability. The skiagraph shows the normal outline of the bones, with in addition an amount of callus on the coronoid process of the ulna (?) and a free fragment of bone (?) above and external to the head of the radius. (See figure.)



CASE IV.—External view, showing displaced fragment of bone.

This case has not yet been operated upon. It illustrates better than any I have ever seen the uncertainty which still exists as to the interpretation of the skiagraphic picture, and it also shows the obscurity of many of these combined bone- and joint-lesions. I exhibited this patient, with the skiagraph, at a recent meeting of a surgical society. He was examined by several skilful and able surgeons, each of whom reached a different conclusion as to what he saw in the picture and felt in the arm. They all differed from my own view. The case will be reported in full after operation.

V. *Excision of the head of the radius.*—This case, of excision of the head of the radius for forward luxation with limitation of the power of flexion, was sent to the hospital by Dr. D. P. Miller, of Huntingdon; the history was obscure, as a previous injury had made a clear diagnosis impossible.

Excision of the head of the radius was decided upon and the operation was performed; the patient regained the power of flexion, with, however, only a very slightly increased amount of pronation and supination.

The skiagraph, taken after the recovery of the patient, shows the radius after the excision of the head and also an old fracture of the ulna with adhesions to the radius, accounting for the limitation still remaining in the power of pronation and supination. It also illustrates in a most marked manner the great usefulness of the Röntgen photographs in cases of old injury that are sent to hospitals for treatment, without a true history or diagnosis of the condition of the parts at the time of the former accident. The failure to secure a greater amount of pronation and supination was a disappointment to me at the time, and seemed inexplicable. The discovery of the old fracture and its adhesions completely cleared up all doubt as to the cause of the continuing disability and at the same time enabled me to decide that further operative interference was not indicated.

VI. *Curvature of the radius due to arrested development of the ulna at its distal epiphysis.*—E. A., aged fifteen years, came to the hospital for advice in January, 1896. The family history showed one case of tuberculosis, a paternal aunt, but there were no other cases in any other generation. The paternal grandfather had an epithelioma of the lip, which was excised without recurrence.

The patient had had the diseases of childhood, but no severe or protracted illness. The present trouble began in the seventh or eighth year, when a little lump was noticed on the arm and the patient complained of pain located at that point. There was no sign of curvature at that time, it has come on gradually since, while the pain has been inconstant and rheumatic in character, seemingly following a slight cold at each attack.

The patient has fair use of the hand and can write with it and do almost everything needful, so no operation was advised.

The skiagraph and the photograph show very well the condition and appearance of this forearm, and, if functional disability were greater, would serve excellently in locating the proper seat for operation if, for example, excision of a portion of the radius were decided upon.

VII. *Diastasis of the distal epiphysis of the humerus, resulting from a fall on the hand.*—W. McL., aged eleven years, came to the hospital on March 31, 1896, with fracture of the humerus.

The history was of a fall from a wall five feet high to the pavement, striking on the left hand. The patient weighed about seventy-five pounds; he sustained no other injury.

The case was diagnosticated and dressed before the skiagraph was developed, the latter demonstrating the correctness of the diagnosis and showing the position of the fragments resulting from this rare form of epiphyseal separation.

The new record that will now be made and kept of such cases as this will in time alter our statistics entirely as to the frequency of various forms of fracture or of epiphyseal injury. It will no longer depend on the skill and experience of the particular surgeon (though they will be of no less value to the patient than before), but will doubtless soon be made up of irrefutable testimony as to the exact conditions present.

VIII. *Diastasis of the proximal epiphysis of the humerus, with overlapping of the fragments and union in a faulty position.*—S. B., aged sixteen years, fell heavily on the left shoulder, while playing football, in December, 1895. He passed through the hands of two doctors; the condition was then recognized by Dr. E. M. Corson, of Norristown, who sent him to the hospital for operation.

At the operation a longitudinal incision through the deltoid toward the anterior border showed the proximal end of the lower fragment overlapping the upper fragment by about two inches, with firm bony union between the two fragments. The upper end of the lower fragment lay beneath the coracoid process and interfered materially with the function of the joint. The upper portion of the lower fragment was resected, giving the joint free motion. The patient made a good recovery. The skiagraph showed the position of the fragments after the operation and their lateral union in a faulty position.

IX. *The results obtained in excision of the knee.*—This skiagraph shows the union between the femur and tibia resulting after an excision for marked tubercular disease. As in the cases of ununited fracture, it illustrates the advantage which may accrue from escaping the necessity of determining by an attempt to elicit motion whether or not bony union between apposed bones has been obtained. Very often while both patient and surgeon are anxious as to the result of operation it can only be determined positively by the application of a degree of force which is in itself harmful. The progress of the case can be watched if necessary by the use of this method, any displacement of bones immediately remedied, and the final outcome seen without the very least disturbance of the parts.

X. *Foreign bodies in the arm.*—This skiagraph shows a piece of steel in the lower portion of the upper arm, which was easily located by the aid of the skiagraph. It shows, however, as has already been said, merely the relation of the steel to the inner border of the arm, leaving in doubt its relation to the anterior or posterior surface. The former point was easily made out by exact measurement, and, of course, in this case and in this locality, removal was easy. But it might be of vital importance to know the depth of the layer of tissue occupied by such a body. A second radiograph taken laterally would supply this information.

XI. *Bullet in the forearm.*—This was an interesting illustration of the difference in accuracy between the old methods and the present ones in the search for foreign bodies. The bullet (32-calibre, rifle) had entered the upper arm on the outer side, years before. An elaborate dissection had been made some time afterward in the attempt to find it. The patient was annoyed by the knowledge of its presence and complained of more or less vague nerve-pain affecting the whole extremity, no localizing symptoms being present. The arm was large and muscular. The skiagraph happened to include the forearm and by accident the bullet showed on the extreme edge of the plate. It lay on the inner edge of the ulna, partly overlapping the interosseous membrane. While Von Bergmann's warning against meddlesome surgery in these cases is timely and well-founded, it is certain that in this situation there were possibilities of later troubles if by a second traumatism the sharp edge of the missile had been driven against either the nerves or vessels of the part.

XII. *Metatarsalgia.*—Mrs. ——, a patient of Dr. S. Weir Mitchell, had suffered for years from pain about the metatarso-phalangeal junction of the right foot.

The skiagraph shows that as a result of wearing pointed shoes there is a deformity consisting in part of the obliteration of the normal metatarsal spaces, with consequent pressure upon digital nerves and pain, sometimes intolerable. Walking in the bare feet or in stocking-feet as a systematic exercise is, in mild cases, sometimes curative. Resection of portions of the metatarsal bones is indicated in others. In either case the skiagraph is of great advantage as a guide to the surgeon.

XIII. *Condensing osteitis.*—This skiagraph shows the femur of a young adult, a patient of Dr. Pyle, of Wilmington, who has had a tubercular osteitis of the lower end of the femur with necrosis. Following operation the wound healed entirely. The picture was taken some months later. It appears to show distinctly the area of condensing and formative osteitis which followed the operation, and also seems to show that no cavity and no sequestrum remain. Such deductions will, however, become more and more positive as we obtain larger numbers of skiagraphs, both of diseased conditions and of normal ones with which to compare them.

XIV. *Subperiosteal abscess.*—This skiagraph, taken from the diseased right and normal left thighs of a child, shows indistinctly on the right the outline of a very large swelling having every clinical characteristic of sarcoma, occupying its upper two-thirds. Months previously I had made a diagnosis of periostitis in this case. This fact led me to consider the possibility of abscess, although the physical conditions of the swelling seemed most unlike it. The skiagraph also seemed too indistinct in outline to represent a true bony growth, though as yet all this was problematical. At any rate the case proved to be an enormous abscess, stripping the periosteum from the femur throughout its entire length. At the time of operation the child had a temperature of 100° to 101°. It is apparent that even such swellings, while far more indistinct in the skiagraphs than normal bone, and probably not so definite as growths originating in bone, may yet easily be differentiated from the surrounding structures.

I confidently anticipate great improvement in this direction and the extension of the method to the differential diagnosis between abscess and new growths involving deeper portions of the body.

XV. *Foreign body in the œsophagus.*—This case was the first, so far as I know, either in this country or abroad, in which the presence of a foreign body in the œsophagus was revealed by the Röntgen rays. A child, aged two years and five months, a patient of Dr. Taubel, of Philadelphia, had been complaining for ten days of some difficulty in swallowing and had begun to reject all solid food, although it would still take small quantities of milk. Attempts at feeding it with even semi-solids invariably resulted in vomiting. There was no clear history of any foreign body having gained access to its digestive tract, but it was known that a plaything known as a jack-stone was missing from a set which the child had been using. When she was brought to me I sent her at once to Professor Goodspeed to have a skiagraph made, with the result of immediately obtaining the most accurate and definite information. The plate obtained after a three minutes' exposure revealed not only the presence, but the precise location of the body. The following morning, after carefully weighing the chances of the case after œsophagotomy or gastrotomy, I decided in favor of the latter, as the length of time which had elapsed made it probable that the jackstone had become very firmly lodged and would be difficult to withdraw by the forceps even through an œsophageal wound. The result showed the correctness of this belief. After the stomach was opened a fine rubber explorer was passed through the pharynx and out of the stomach-wound carrying a long piece of stout silk attached to it. The explorer was withdrawn and wads of gauze of various size were tied to the silk; some of these could not be carried either way beyond the jack-stone, but, whether pulled downward through the mouth and pharynx or upward through the stomach, were arrested when they reached it, even although very considerable force was used. Finally, however, the proper size was found and the jack-stone was pulled downward into the stomach, from which it was easily extracted. The mucous membrane was then at once stitched together with a continuous catgut suture and the whole wound was inverted by a continuous Lembert suture. The operation, including preliminary attempts at removal by forceps, took something less than a half hour. The child reacted well, and has entirely recovered.[1]

The propriety of attempting extraction by forceps, guided by direct inspection at the time with the aid of the fluoroscope, was considered by me; but the attempt was not made on account of the presumably ulcerated and inflamed condition of the œsophagus, contraindicating instrumentation in that canal. The method will doubtless prove applicable in the future to many cases seen earlier.

A large number of other cases have occurred in my service, but these are sufficiently illustrative of the extent and variety of the application of this method of surgery.

Professor Goodspeed has kindly prepared the following account of the method by which he secured the excellent and helpful pictures of the foregoing cases:

The apparatus which has been used in the work illustrating this article consists essentially of four parts. The first is a storage-battery of twelve cells, arranged six in series and two in multiple arc, giving an electromotive force of about twelve volts. The second part of the apparatus is a current-interrupter of special construction run by a motor and arranged to give from one to three thousand breaks per second. The contact-points of the interrupter are made of thick pieces of platinum, and on either side are attached the terminals of a variable condenser in three parts to take up the extra current due to self-induction in the coil and thus to make the break more sudden. The third part consists of an inductorium of the Ruhmkorff type, the primary coil of which is attached to the interrupted battery circuit. The secondary circuit is attached to the terminals of the fourth element of our set of apparatus, viz., the Crookes's tube. The tube which has been used in much of the work and found very efficient was made by the Knott Company, of Boston, from a plan made by the writer. It is a glass bulb about four inches in diameter, exhausted to such an extent that under the electric discharge no blue halo appears at either terminal. The glass fluoresces a brilliant green. The cathode or the terminal attached to the negative pole of the secondary coil is a concave aluminum disk about one and a quarter inches in diameter. In the centre of the curvature of this, viz., about three inches from it, is placed the anode, consisting of a flat platinum disk. The wires to which these disks are fastened are sealed into the glass by German enamel and covered nearly their whole length within the tube by this material.

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[1] This case was published in full in the University Medical Magazine for June.

By this means internal sparking is almost entirely avoided. We have several coils capable of giving different intensity-effects. The one which seems best adapted to all grades of work gives a ten-inch spark in air. The exposures required depend, of course, upon various conditions, and were from a few seconds to three or four minutes. This leads us to an important detail in connection with this work, viz., the sensitive plate upon which the negatives are made. We have made many experiments upon various plates on the market and have been associated with Mr. John Carbutt in the development of a plate especially adapted to this purpose. Upon the efficiency of the plate that Mr. Carbutt now makes depends, I feel sure, much of the excellence of the work that we have lately done.

For sharpness of detail it is necessary, of course, to have the part to be skiagraphed as near the film as possible. It is found convenient, therefore, to wrap the plate in two or three thicknesses of thin black rubber-covered cloth, which is quite effectual in excluding all light during the exposure. This plate is then bound tightly to the part with long gauze bandages, film-side to the skin. The Crookes's tube is placed on the other side of the part from one to two feet away, according to circumstances. It is probable that the resultant effect obeys the law of "inverse squares;" so that to produce the same density in the negative in two experiments the times of exposure should be proportioned to the square of the distance of the tube from the plate.

Many details in the manipulation of the various parts of the apparatus have to be attended to continually, and the best results are obtained only when all the various parts are carefully and properly balanced. When the cathode is large the tube seems to be more powerful for the time, but it wears out soon—*i. e.*, its exhaustion gets so high that the largest coil will produce no discharge through it. Under these circumstances it has to be opened and re-exhausted to the proper degree. It is clear, then, that the conditions necessary for the very best results cannot be realized very long at a time.

The fluoroscope, consisting of a screen of cardboard covered with calcium tungstate, is a very useful and almost necessary addition to the equipment. If such a screen takes the place of the photographic plate, and the eye, shielded from external light, be placed behind it, shadows of the bones or foreign bodies can be plainly seen on the screen.

In many simple operations the use of the fluoroscope would be quite sufficient to gain all needed information.

# PAINFUL POINTS IN GOUTY COMPARED WITH RHEUMATIC ARTHRITIS.[1]

By W. H. Thomson, M.D., LL.D.,
PROFESSOR OF PRACTICE OF MEDICINE IN THE NEW YORK UNIVERSITY.

The differential diagnosis between acute gout and acute rheumatism is usually simple enough in typical cases, especially when of recent origin. In many chronic cases, however, particularly when gouty arthritis has become general, the differentiation may not be so easy, and in practice we frequently find gouty cases treated for rheumatism or rheumatic patients dosed with colchicum.

For a number of years I have been accustomed to point out that a careful manipulation, of the inflamed joints in these affections will show specific contrasts between them in the localization of the greatest tenderness on pressure. I supposed that this clinical fact had been noted before, but, not finding any reference to it in the works which I have been able to consult, I take this occasion to present the following observations on cases of gout and of rheumatism occurring in my service at the Roosevelt and the Bellevue Hospitals, of New York, during the past few months, with some cases of gout in private practice.

Gout. Whole number of cases of gout, 34 : males, 27 ; females, 7. The first attack in the history of the patients began in the lower extremities in 31, or 98.9 per cent. In two chronic cases the patients were uncertain where it first began. In one, a painter by trade, and affected with chronic plumbism, the first attack involved the left shoulder as well as his feet.

The first attack was monoarticular in 73 per cent., and polyarticular in 27 per cent. I am inclined to think, however, that the percentage of monoarticular first attacks was higher, particularly in the hospital patients, for the memory of some of the more chronic cases on this point was rather indefinite.

The pulse was noted as of high tension in 98 per cent., and not of high tension in 2 per cent. The arteries were found thickened in 44 per cent., and not thickened in 56 per cent.

Tophi were present in the ears in 12 cases, or 35.1 per cent.

As to painful points: There were 38 instances of inflammation of the knees. In every one of these cases, without exception, the points of greatest tenderness on pressure were on the condyles. The more acute the inflammation, the more distinctly is this tenderness pronounced. In the decline of the inflammation tenderness will persist there when it cannot be elicited elsewhere. This is in marked contrast with acute rheumatism, in which, as we shall see, increased tenderness on the condyles, as compared with the other parts of the joint, was not once found.

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[1] Read before the American Association of Physicians, Washington, May 1, 1896.

Of 23 cases of inflammation of the ankles, the points of greatest tenderness were found on the malleoli in 11, just below the malleoli in 10, and on the astragalus in 2.

On the great toe no uniformity in points of greatest tenderness was made out.

The hip-joint was affected in two cases, but without any localized tenderness to pressure in either.

In the upper extremity, among the numerous phalangeal finger-joints affected, and in many instances distorted with gouty deposits, those of them which were painful enough to give indications showed, without exception, the points of greatest tenderness on the condyles—that is, on transverse pressure; while pressure between the dorsal and palmar surfaces did not occasion pain, or very slight pain, compared with pressure on the condyles. I have found this in private practice a valuable sign, in women especially, as these joints are frequently in them the only ones involved in gouty inflammation.

The elbows were affected in 12 cases. Of these the most tender points were on the condyles in 6, on the olecranon in 4, and on both the condyles and the olecranon in 2.

The shoulders were involved in 5 patients. In 2 of them both shoulders were attacked. No particular point of tenderness was noted except in 1, and that was on the acromion.

The cases of inflammation of the metacarpo-phalangeal joints were not enumerated, because their lateral tender points cannot be isolated. The same applies to the wrists, but in both cases of these joints there is more tenderness to lateral pressure than in rheumatism.

Rheumatism. Number of cases of rheumatism observed, 49. All of them hospital patients. Males, 32; females, 17.

Among these the heart was or had been affected in 18, or 36.7 per cent. Tonsillitis occurred shortly before or during the attacks in 11, or 22.4 per cent. Pleurisy occurred in 3 cases, or 6 per cent.

The pulse is reported as of low tension, or compressible, in 42, or 85.7 per cent.; of high tension in 5, or 1.02 per cent.; and in 2 not stated.

The first attack was polyarticular in 46, or 94 per cent.; monoarticular in 3, or 6 per cent.

In rheumatism, particularly when a joint is acutely inflamed, there is usually more superficial or cutaneous tenderness than in gout. This may mislead as to the existence of special points of tenderness unless the examination be made with special reference to this subject, when in the great majority of instances, notably in some joints, rheumatism will be found to be scarcely less specific than gout in the localities of greatest pain on pressure, and, what is equally important, that these are in only a few joints the same as in gout. Thus, in the knee, the typical points of tenderness are on the tendon of the quadriceps just above the patella, and below it also at the tendon insertion. Posteriorly equally characteristic points of tenderness are found along the tendons of the hamstring muscles. Out of 58 cases of inflamed knees in my list, 53, or 91.4 per cent., were thus typical, and in 5, or 8.6 per cent., the pain was uniformly diffused over the joint. In no case were the condyles the seat of most tenderness.

Rheumatic inflammation of the ankles is not so distinctive in the location of painful points as in the case of the knees. Of 32 cases my notes are that the most pain was elicited by pressure on the tendons of the dorsal aspect of the joint in 20, or 64.4 per cent. This pain, however, is not so pronounced as in the tendons of the quadriceps and hamstring muscles of the knees. In 3 cases, or 10.6 per cent., the most painful points were under the malleoli; and in 8, or 25 per cent., there was no specialized place.

The hips were affected four times, but no localized pain was noted in either.

Of the joints of the upper extremity, the shoulders were affected in 20 cases. In only one of these was a special tender point found on the coracoid process.

The elbow was affected in 13 cases. Of these in 9, or 70 per cent., the most painful point was elicited by pressure on the triceps tendon. In 4, or 30 per cent., there were no special points.

The wrists were affected in 24 cases. Of these the most pain was elicited by pressure on the tendons of the dorsal and palmar aspects in 20, or 83.3 per cent. It was uniformly diffused in 3, or 15 per cent.; and one case complained of most pain on transverse pressure, as in gout.

In every case noted of inflammation of the finger-joints in the rheumatic patients the pain was localized in the tendons and not on the condyles.

Why the hips and shoulders do not commonly show specially painful points may be due to these joints being so covered by large muscles.

It seems natural to infer that the difference between these two forms of arthritis in the respects noted, of pain on pressure, is because gout chiefly affects the periosteal, while rheumatism chiefly attacks the synovial structures.

With the exception of the hips and shoulders, therefore, it would seem that the distribution of pain on pressure may be often of use in the discrimination of these two articular inflammations. The ankles and wrists also do not present such marked contrasts as the more simple joints, apparently from the greater number of bones entering into the formation of these articulations.

# ON THE FUNCTIONS OF THE NEURON,

## WITH ESPECIAL REFERENCE TO THE PHENOMENA PRESENTED BY HYSTERIA AND HYPNOTISM.

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There has been noticeable of late years a tendency strangely to misconstrue the structure of the nervous system and to misinterpret the truths which that structure teaches. Curiously enough, this tendency has appeared with our increasing knowledge of the details of the intimate structure of the neurons and of the relations which they bear to each other. It is known, for instance, that the afferent fibres, those which convey impressions from without up to the cortex [themselves processes (axons) of peripheral neurons], terminate not in nerve-cells, but in the uppermost layer, the so-called molecular layer or molecular plexus of the cortex. Here in some way the minute divisions of the afferent fibres affect the fibres of this molecular plexus. The latter are in turn in direct communication with the nerve-cells of the cortex, are, in fact, themselves cell-processes. These facts suggested the idea that afferent impulses are diffused through the molecular plexus without involving or affecting the nerve-cells at all, and according to this interpretation the nerve-cells are left out of consideration entirely in studying nervous phenomena. This view has been especially advanced by Nansen, who maintains that the old manner of view relative to the composition of the reflex arc and the physiological importance of the nerve-cells can no longer be sustained, inasmuch as the cells are not in direct communication with each other, and because direct communication between the central nerve-cells and the sensory or centripetal nerve-fibres is equally lacking. The reflex arc is constituted, according to Nansen,[1] first, by the centripetal nerve and its fibrillary ramifications passing directly into the nervous meshwork of the cortex—that is, into the molecular layer; secondly, by the propagation of the excitation through this molecular plexus; thirdly, by the transmission of stimuli to the minute lateral branches of the centrifugal or motor nerve-fibres. It follows that impulses are transmitted to the superior centres without passing directly through the nerve-cells. "We can admit in the same manner," continues Nansen, "that the voluntary impulses emanating from the nerve-fibres which emerge from the superior centres transmit themselves directly to the centrifugal fibres of the inferior centres without passing through the nerve-cells of these centres." He says, further, that it is impossible to admit that the nerve-cells of the inferior centres possess a direct importance either in relation to reflex movements or to the voluntary movements, and that this seems to apply equally well to the nerve-cells of the superior centres. This view forces us to the conclusion that the activity of the nervous system, intelligence, consciousness, etc., is seated really in a fibrillary meshwork of the cortex, the molecular layer, and has nothing to do with the nerve-cells of the cortex. The latter, indeed, deprived of their psychic functions, become simply "trophic" centres. They serve only for the maintaining of the nutrition of the nerve-fibres and their innumerable arborescent ramifications.

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[1] Soury, Les Fonctions du Cerveau, p. 316.

This view of Nansen's has been adopted by my esteemed colleague, Dr. Mills, who, in a discussion on cerebral localization at the last meeting of the American Neurological Association, and also in the *Text-book on Nervous Diseases by American Authors*, has maintained this position; he holds that "impulses are conveyed from processes to processes through the entire reflex arc, through the entire length of a cortico-efferent, or a cortico-afferent, projection-system," without passing through nerve-cells, and that "the function of the nerve-cell body is trophic;" that its "nuclei and nucleoli preside over the nutrition of the long or short fibres which pass out of or grow into them;" and, further, that cells are of enormous bulk in order that they may be able to sustain these processes. In his words, "the aggregations of gray matter at various levels of the nervous system are watering- and feeding-places, not places for renewing nerve-activity."

Certainly this view does violence to the fundamental principle that the properties of a given tissue depend upon its cells, and that the cells are the integral parts of the tissues. Nowhere in the whole range of biology do we find a similar anomaly obtain as is implied by this view. It asserts that merely incidental structural attributes are of greater value than the individual cells, whose building up constitutes the tissue. Surely there is here an intrinsic contradiction.

Not only upon general principles is this view untenable, subversive of all that we have hitherto learned; but, if carefully analyzed, it is found to present insuperable difficulties. If it be true that a nerve-fibre diffuses the energy which it conveys: in a general way, scatters it though all the fibres or nerve-cell processes near which it happens to lie, it becomes impossible to explain the definite and precise actions of the nervous system, properties which are so characteristic of it. Nothing but hopeless confusion of function could result if such a thing were possible. It would mean that nerve-currents course indiscriminately without relation to each other through this network of fibres. It would mean that everything that had been done by nature to conserve and isolate nervous impulses by enclosing the nerve-fibres in special sheaths of insulating material previous to their entrance into the cortex had, after all, no purpose, because in the end the currents are turned wildly loose into a common receptacle.

The conservation of nerve-currents along cell-processes, no matter how long these may be, or whether they be in the cortex or below it, is an absolute requisite. Were it not so, the various commissural and association tracts, whose existence we know of upon anatomical as well as upon physiological grounds, would assuredly be unnecessary, would have no meaning if the loose and unrestrained diffusion of nervous energy in the cortex, such as is implied by Nansen's view, were possible.

Further, such facts as we possess are directly opposed to a diffusion of nervous energy. According to Berkley,[1] by far the larger number of the finer fibres of the cortex are medullated almost to the extremities of the end-terminations. It is highly probable that Berkley maintains "that in no instance except at the free termination is there actually such a thing as a naked axis-cylinder," and that "the conduction of the nerve-force from cell to termination and from termination to cellular protoplasm again is only through the medium of the ending of the nerve-fibre, and that there is no diffusion of the dynamic forces through the cortex, but that the action is a direct one." In this connection he further says: "To suppose for an instant, that naked axis-cylinders are present in considerable numbers in the cortex is to me an impossibility, for we must necessarily suppose in such an event that in the closely packed arrangement of axons and dendrons presented by the outer portion of the pyramidal and in the molecular layer, where fibres and dendrites touch each other in all directions, the stimuli would quite as often be aberrant as direct, and as frequently reach the wrong as the right destination. Naked axis-cylinders are in all likelihood a physiological impossibility in the cerebrum, for were they numerous we can suppose nothing but a constant overflow of stimuli from one cell to another, and consequent inco-ordination, not only of thought, but also of action."

Far from lending support to the view of Nansen, that the cell is to be left out of account in the consideration of nervous action, the discoveries of Golgi, Ramón Cajal, Van Gehuchten, and others have shown exactly the reverse. They have demonstrated beyond all question that, as in all other tissues, the cell is the actual integral structure. And while it was formerly held that the various cell-processes anastomosed freely with each other, we now know as a matter of fact that such anastomoses do not occur. The nerve-cell is a cell entirely by itself. It is a cell as distinct and as self-limited as any cell of any tissue with which we are acquainted.

Far from being continuous through its processes with other cells, we learn that its processes nowhere fuse with other structures. Its processes are well limited, sharply defined, and bear no relation to those of other cells save that of propinquity or perhaps contact. The individuality of the nerve-cell as a morphological integer is wholly preserved.

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[1] Medical News, November 9, 1895, p. 506.

If we grasp this idea in its full meaning, our conception of the nervous system changes profoundly. It is no longer a stringing together of telegraph wires and way stations, but it consists of an aggregation of cell-integers, each one of which does its share in the production and in the transmission of nervous energy. For instance, the impulse proceeding from a motor neuron in the cortex is transmitted by the neuron through its own protoplasmic extension (the efferent nerve-fibre) to a definite aggregation of cells in the spinal cord. It communicates its energy to these cells in the spinal cord without in any way fusing with their protoplasm or their processes. In the same way the impressions that come by the various sensory paths come from peripheral neurons, those situated in the skin, in the retina, in the ear, in the taste-buds, or in the Schneiderian membrane, and are conveyed by fibres which are merely protoplasmic extensions of these peripheral neurons up to the cortex. Here in turn these fibres transmit the energy they convey to the cortical neurons without fusing with the latter or with their processes. Everywhere, and no matter in what light we view the nervous system, the signal importance of the nerve-cell as an individual entity is strikingly apparent.

A consideration of the above facts has suggested to me the following thought: Can it be that the neuron is not an absolutely fixed morphological element? Can it be that it possesses a certain, though perhaps limited, power of movement? Realizing the practical value and the wide application of this idea, I have examined the literature to see whether a similar interpretation of nervous phenomena has occurred to others, and to gather such facts, if any, as could be brought forward in its support. I found that this thought had occurred independently to three observers, one in Germany and two in France. I found that in 1890 Rabl-Rückhard, in a short paper published in the *Neurologische Centralblatt*, had suggested the view that nerve-cells have an amœboid movement, and he also hinted briefly at the possible significance of such a fact, if true, upon our interpretation of the phenomena of hysteria. Rabl-Rückhard's ideas attracted little or no attention, and in August, 1894, without any knowledge of Rabl-Rückhard's theory, in a paper on "A Case of Hysteria of Peculiar Form," published in the *Revue de Médecine*, Lepine advanced the same view. In endeavoring to interpret the various shifting phenomena observed in his patient he advanced the idea that the neurons were capable of movement to such an extent as to enable them to vary the degree of their relation to each other. About half a year later Mathias Duval, without any knowledge of either the views of Rabl-Rückhard or those of Lepine, in a communication made to the Société de Biologie, advanced the same theory. A week later Lepine, before the same body, repeated his former arguments in its support.

Curiously enough, this view, so suggestive, so pregnant with possibilities, did not meet with the indorsement either of that veteran histologist, Kölliker, or that other high authority, Ramón Cajal. In a paper entitled "Some Conjectures on the Anatomical Mechanism of Ideation, Association, and Attention," published in the *Revista de Medicina y Cirurgia Practicas*, May 9, 1895, Ramón Cajal contended that the nerve-cells do not move, because (1) the terminal branches of the nerve-cells of the cerebellum, of the olfactory bulb, of the acoustic ganglia, optic lobes, etc., always present the same shape and the same degree of approximation to the cell-bodies irrespective of the mode of death of the animal (chloroform, hemorrhage, curare, strychnine, etc.); (2) because the terminal nerve-branches of the retina and of the optic lobes in reptiles and bactrachians presented always the same appearance, no matter whether the organs mentioned had remained in a condition of rest (the animals having been killed after remaining in darkness for a long time) or whether they had been functionally active (the animals being killed after prolonged exposure to sunlight).

While Ramón Cajal thus opposes the theory of mobility of the neuron, he maintains, on the other hand, that the neuroglia-cells possess a great degree of mobility. He points out, for instance, that the neuroglia-cells of the cortex are at times stellate and at others much elongated. Their processes have numerous short, arborescent, and plumed collaterals. Two phases can be observed in them: first, a stage of contraction, in which the cell-body becomes augmented while the processes become shortened and the secondary branches disappear; secondly, a stage of relaxation, during which the processes of the neuroglia-cells are again elongated. Ramón Cajal maintains that the processes of the neuroglia-cells in reality represent an insulating or non-conducting material, and that during the period of relaxation they penetrate between the arborizations of the nerve-cells and their protoplasmic processes, and render difficult or impossible the passage of nerve-currents. On the other hand, when the processes of the neuroglia-cells are retracted, the various nerve-cell processes which they formerly separated from each other are now permitted to come into contact. To me it seems as though Ramón Cajal admits the very thing against which he contends. Evidently, if the nerve-cell processes are not at one time in contact, and at another are in contact, they must certainly move, and the question at issue is self-admitted It certainly does not matter whether the nerve-cell processes move little or move much, but that they move at all is the question at issue; and this, it seems to me, Ramón Cajal admits, although he makes that movement a purely passive one and dependent upon the interposition of the processes of the neuroglia-corpuscles. It is certainly a minor point whether the movement of the nerve-cell processes is active or passive, though it seems that it is far from evident, from the histological facts at our disposal, that the neuroglia-corpuscles play the *rôle* of an insulating material. To me it further seems that a single positive observation outweighs all other negative observations, no matter how great the authority behind them, and this positive observation has actually been made. Wiedersheim[1] actually saw in the living animal, *leptodora hyalina*, an entomostracan, the nerve-cells in the œsophageal ganglion move. The œsophageal ganglion may in one sense be regarded as the brain of the animal, inasmuch as it receives the fibres of the optic nerve and Wiedersheim saw its cells move and change their shape. He describes their movement as slow and flowing. Certainly this observation possesses a profound significance. Even if the animal in which the phenomena were observed is far removed from the vertebrates, it must be remembered that it is just in the lower forms that general biological truths must be sought for, and it is just in the lower forms that they have been found. I do not for a moment contend that the nerve cells of vertebrates possess a gross amœboid movement as in the œsophageal ganglion of the entomostraca; but I do contend that it is in the highest degree probable that such facts as we have, scanty though they be, are in favor of the view that a certain amount of movement does take place in the terminal portions of their processes, their dentrites and their neuraxons, although this movement is probably small in extent.

Let us turn our attention for a moment to the subject of hysteria, and let us see what a flood of light is cast upon this subject, heretofore so obscure and mysterious. Let us take the simple example of a hysterical paralysis, and see how easily it is explained. The neurons of a certain area of the cortex, for instance, retract the terminal branches of the neuraxon to such an extent that the latter are no longer in contact, or sufficiently near to the neurons of the spinal cord which supply the muscles of the paralyzed part. It explains also the marvellous fact that a hysterical paralysis may at one time be so real, so genuine, as to be indistinguishable from a grossly organic paralysis, and yet the next moment upon a suggestion may absolutely disappear. The shifting of symptoms in hysteria, this sudden disappearance of paralysis or anæsthesia, can be explained by the view here advanced as it can be by no other. When power is suddenly re-established in a hysterically palsied limb it simply means that the terminal branches of the cortical neuraxon, previously retracted, are again extended so as to re-establish the proper relations with the spinal neurons. Take again the example of a hysterical anæsthesia. How often do we see a segmented anæsthesia or a hemi-anæsthesia coming and going under the influence of no other stimulus than that which applies to the psychic make-up of the individual, namely, a treatment which we call mental or moral treatment, or that more powerful treatment, suggestion under hypnotism. It would be interesting, indeed, to follow out the ideas here brought forward in their application to the various phenomena presented by hysteria, its sensory, motor, and visceral stigmata. Even the hysterical convulsion, I contend, can be explained by the view here advanced. Time will not, however, permit more than to indicate the line of thought.

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[1] Anatomischer Anzeiger, 1890, p. 673.

When we turn to hypnotism we can see what a ready explanation it affords for the phenomena presented. Under the fixed stare necessitated by the ordinary method of bringing about hypnosis, and under the suggestion of sleep, the neurons are thrown into certain fixed relations with each other, corresponding solely to the ocular strain and singleness of thought induced. At the same time such relations of the neurons as ordinarily bring them into true contact with the outer world are suspended, probably by retraction of cell-processes. We can easily understand, in the light of the theory here advanced, how under hypnotic suggestion a hysterical paralysis disappears, or how, under hypnotic suggestion, anæsthesia is produced in this or that part of the body. Further, the various stages of hypnotism itself—lethargy, catalepsy, somnambulism—are all of them capable of a scientific explanation upon this theory. Hypnotic lethargy, for instance, a stage so easily produced in the majority of patients, merely signifies that so general has been the retraction of the cortical neurons from each other that not only is sleep produced, but also a stage of general motor relaxation, due to the retraction of the terminal branches of the neuraxons in the spinal cord. In hypnotic catalepsy, on the other hand, the reverse obtains. Here the relations of the cortical neurons to the spinal neurons (contact or increased proximity, whatever it may be) are established to a degree beyond that which is normal, and the consequence is an enormous general increase of muscle-tonus. In somnambulism, again, certain of the neurons, especially those which stand in direct relation with the various sensory organs, form partial combinations with a limited number of other cortical neurons, so as to produce the various limited psychic phenomena characteristic of somnambulism, whilst the great bulk of the neurons of the cortex, the summation of whose action constitutes the ego and brings it into close relation with the outer world, have their processes retracted in sleep.

Leaving this interesting field, let us see for a moment of what enormous value this interpretation of cortical action is for normal mental phenomena. Sleep, instead of resulting from brain anæmia, or some other apocryphal condition of the circulation, merely means that when the substance of the cortical cells has been diminished by functional activity, which diminution we have reason to infer, from the researches of Hodge,[1] (on the changes in nerve-cells in fatigue), there comes a time when the cell-processes are retracted, so that the neurons no longer stand in active relation to each other. Interchange of action cannot then take place; unconsciousness follows; sleep is established. Spontaneous wakening merely means that after nutrition has reached a certain point, a point where the wasted cell has been replenished, extension of the cell-processes again takes place, and interchange of active functional relations is reestablished.

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[1] Journal of Morphology, 1892, vol. vii p. 95.

Numerous other ideas also suggest themselves in relation with the view here advanced. Take, for instance, a train of thought. This appears to follow *purely mechanical* lines. Thus a sequence of sound-vibrations impinging upon the peripheral auditory neurons, the auditory cells, produces in them a change, which in turn affects the relations which their neuraxons bear to the auditory nuclei, and secondarily to the auditory cortical neurons. Not only are the latter affected by the impressions received from the afferent neuraxons, but they in turn react in such a way as to change their relations to each other, and the new positions assumed by them will depend largely upon the fact as to whether a similar sequence of impressions has passed through them before. If so, the old combinations will be reformed, and as a corollary the recognition by the ego of the sounds as something heard before. From the cortical auditory centre there now passes through the general cortex a series of combinations among the neurons, also along the oldest and best-travelled lines, so that a given sequence of musical sounds may suggest at first a familiar air, and a moment later a vivid recollection of an opera once heard and seen. Here is the physiology of memory.

A startling thought which also suggests itself in connection with the theory of cortical action advocated in this paper is that *not all of the neurons are functionally active at the same time.* It is exceedingly probable that the number varies greatly. For instance, in fatigued states fewer combinations are made—fewer are possible—because of the exhausted condition, the diminished volume of the cell-protoplasm. After rest, on the other hand, not only are combinations more readily made, but a larger number of neurons are active. It is further probable that in states of mental or emotional excitement the number of neurons that are active and the number of combinations accordingly formed enormously exceed those occurring during ordinary mental states.

Many other thoughts also suggest themselves, and some are extremely interesting. For instance, the receptivity and marvellous adaptability of youth and early manhood appear to depend upon the relatively great mobility of the cell-processes, while the retarded and restricted mental action so often seen in old age appears to be related to a much diminished mobility of these processes. Certain it is that the theory that the neuron is not an absolutely fixed morphological element renders clear and comprehensive many of the well-known facts of mental physiology. The application of this theory, for instance, to memory, sequence of thought, association of ideas, and even more complex mental processes, is evident, but the limits of this paper have forbidden any but a mere mention of them.

# EXTRAUTERINE FŒTATION.

## REPORT OF FIFTEEN CASES TREATED BY OPERATION.

By Andrew J. McCosh, M.D.,
of New York.

Within the past four years the following fifteen cases of extrauterine fœtation have been operated on by me at the Presbyterian Hospital. The admission of so many cases to the service of one surgeon in a general hospital must indicate that an ectopic pregnancy is a comparatively common occurrence. From the histories which follow certain facts have been derived. The youngest patient was twenty-three years of age, the oldest thirty-nine. Three were nulliparæ. Twelve had previously been normally pregnant, nine having borne one or more children, three having had miscarriages only. Five had complained of more or less pelvic pain prior to the ectopic gestation; ten gave no history of special distress in their pelvic organs.

*Symptoms during the ectopic pregnancy.* All had suffered from pain. In three the pain had been slight, in twelve severe. All had skipped one or more menstrual periods. In fourteen there had been irregular uterine bleeding; in one there was no history of bloody vaginal discharge. In eight there had been signs of shock on one or more occasions indicating rupture, in two of these amounting to severe collapse. In seven there had been apparently no sign of shock. Seven had considered themselves pregnant; eight had not suspected the existence of pregnancy.

*Conditions found at operation.* In two cases the fœtus was in the tube, which was unruptured (eight weeks and ten weeks). In five rupture into the broad ligament had occurred (less than three months). In eight the fœtus or its remains was found in the peritoneal cavity. The duration of the pregnancy was under fourteen weeks in thirteen cases, over four months in two cases (four and a half and six and a half months).

It may be well to note that most of these patients were from the lower grades of life and would not be apt to pay special attention to either their menstrual dates or their signs of pregnancy, and perhaps not to pain unless it was severe in character.

It will be noticed from a review of the above symptoms that these cases emphasize the fact that the main points in the diagnosis of extrauterine pregnancy are, first, delay of the menstrual period, with or without signs of pregnancy; second, pain generally severe in character and sudden in its onset, sometimes agonizing, with signs of shock; third, irregular uterine hemorrhage very commonly accompanying the first attack of pain.

Case X. is of special interest on account of the viability of the child, which was fairly robust for a six and one-half months' fœtus. As both the head and extremities were deformed, an incubator was not employed. The history of this case is also of interest because of the frequent and severe attacks of hemorrhage in the cavity of the peritoneum. The placenta was removed at the operation instead of being left *in situ*, as is the usual custom.

Case XII. is of interest on account of the time selected for operation and the large amount of blood found in the abdomen. Laparotomy was done thirty-six hours after the gravest of three hemorrhages. Had the abdomen been opened on her admission to the hospital she would certainly have died on the operating-table. A delay of twenty-four hours enabled the patient to recover sufficiently to withstand the immediate shock of operation. Her depleted state was, however, unable to withstand the poison absorbed from the blood which was necessarily left in the abdominal cavity, and she succumbed on the fifth day. This was the only fatal case.

Case XIV. is of interest on account of three successive ruptures of the fœtal sac, as is shown by the history of the case and by the conditions found at operation. The first rupture, that of the Fallopian tube, occurred presumably between the fifth and sixth weeks. Its contents apparently escaped into the broad ligament and a large blood-clot was left in the tube. The second rupture occurred about two weeks later. It was of the broad ligament, and resulted in a large hæmatocele in the floor of the pelvis, which evidently became sacculated. This was also accompanied by severe pain and by a uterine hemorrhage. The third rupture occurred about the tenth or eleventh week and evidently was of the sac of the hæmatocele, and resulted in either a fresh hemorrhage or an escape of the already clotted blood into the free peritoneal cavity. The conditions found at the operation, consisting of an enlarged Fallopian tube, in the end of which was a cavity in which the fœtus had formed, the distended broad ligament showing a tear in its superior layer, the hæmatocele in Douglas's pouch with a rent in its fragile sac, and the free blood in the peritoneal cavity, form a chain which beautifully illustrates the history of the three ruputres, each one of which was accompanied by pain and "flow."

Case I.—Mrs. D., aged thirty-seven years; married; one miscarriage, six years ago; no children. Menstruation regular and painless. Last normal menstruation November 1, 1891. Considered herself pregnant until January 27, 1892, when she thought she had a miscarriage, as there was sudden uterine hemorrhage lasting some days, accompanied by pain, and followed by severe " colic " which continued two or three days. From February 5th until February 20th felt well, but was then attacked with another " colic " and with vomiting. In a few days these symptoms disappeared, but there remained a continuous pelvic pain. A week later another " colic," and again in another week. Admitted to the hospital on March 14th: Temperature 100°; pulse 92. There had been no vaginal discharge since February 1st. Complained of general abdominal discomfort and enlargement. On examination, to the right of the uterus was a mass the size of a fœtal head. Diagnosis—probable extrauterine pregnancy, which had ruptured.

*Operation, March 16th.* Ether. Median laparotomy. Omentum found tightly adherent to superior surface of tumor and to intestines; ligated in three portions and cut away. Tumor then seen to occupy right iliac fossa and to be adherent to uterus, intestines, and floor of pelvis. It consisted of a thin sac, which was situated in the general cavity of the peritoneum. It was filled with blood-serum, and in it was a four and a half months' fœtus, cord, and placenta. Sac was ruptured; contents removed with moderate loss of blood. Sac peeled from its attachments with ease. The distended and thickened Fallopian tube ligated and removed. The abdomen closed by suture. The patient made a good recovery, was out of bed April 12th, and discharged cured April 20th.

Case II.—M. H., aged twenty-seven years; married five years; no children; one miscarriage (second month) four years ago. With the exception of the abortion, never suffered from pelvic pain until present illness. Menstruation always regular and painless. Last normal menstruation March 11, 1892. April 10th, menstrual molimina for two days, but no flow; noticed fulness of breasts and occasional nausea. May 7th, colicky pain in abdomen, which became localized into a constant pain, or rather a sense of discomfort, in the left iliac fossa. May 10th, when an examination was made a mass the size of a large orange, somewhat soft to the touch and slightly sensitive to pressure, was felt in the left of the uterus; uterus seemed enlarged and soft. Diagnosis of probable extrauterine fœtation.

*Operation, May 12th.* Chloroform. Median laparotomy. To the left of the uterus and adherent to it was found a mass the size of an orange, which evidently contained fluid and blood-clots. On separating it from the adhesions it was seen to be a distended Fallopian tube. Partial rupture with the escape of some bloody serum occurred in extirpating the tube, which was clamped close to the uterus. Clamp was replaced by a ligature, and after cleansing of the pelvis the abdominal wound was closed. In the sac was found a shrunken fœtus seven to eight weeks old. The temperature of the patient did not rise above 99.5°, and she was out of bed on the nineteenth day, and was discharged cured on June 7th.

Case III.—C. P., aged thirty years; married ten years; four children, last four years ago. Menstruation had been regular. For the past four years had suffered from dysmenorrhœa and pain in the right side. Last normal menstruation in the middle of August, 1892. At the next menstrual period, September 15th, the flow was profuse and continued more or less until her admission to the hospital on November 1st. During these six weeks she suffered from abdominal pain, frequently severe in character, and from fever every afternoon and evening. No suspicion of pregnancy. On admission morning temperature averaged 99°; evening temperature 101°. Uterus was enlarged and attached to its right side, and posterior to it was a tumor the size of a cocoanut. Diagnosis of probable extrauterine pregnancy.

*Operation, November 4th.* Ether. In a preliminary examination of the patient by bimanual palpation for diagnostic purposes the tumor was felt to rupture and disappear. This rupture confirmed the diagnosis, as but slight force had been employed. Patient placed in Trendelenburg position and the abdomen opened by a median incision. In the right broad ligament and escaping from it through a tear in its posterior wall were found fluid and clotted blood sufficient to fill a ten-ounce measure, and there were also shreds of tissue which afterward on microscopical examination were found to contain chorionic villi. The right Fallopian tube was enlarged and thickened, and with the ovary was removed. After careful sponging of the cavity the peritoneal cavity was irrigated with salt-solution, a strip of iodoform-gauze inserted for drainage, and the abdomen closed. Recovery was uncomplicated. The gauze was removed on the fifth day. The patient was out of bed on the twenty-fifth day and was discharged cured December 8th.

Case IV.—O. G., aged thirty years; married ten years; three children, last fifteen months ago. Menstruation had been regular and free from pain. Last normal menstruation in beginning of September, 1892. After skipping period about October 1st, she considered herself pregnant and was "treated" by a midwife, the result after the second local treatment being severe pelvic pain and a slight bloody vaginal discharge. This continued, together with a feeling of discomfort referred to the rectum, from October 15th until November 14, 1892, when she was admitted to the hospital. On examination a mass the size of an orange was found behind and to the left of the uterus. No tenderness on palpation. Diagnosis—pyosalpinx or extrauterine pregnancy.

*Operation, November 15th.* Ether. Median laparotomy. Mass was situated in left broad ligament, and was found to consist of a blood-clot and shreds of organized tissue. Left tube much enlarged and adherent to the sac, which, with the left tube and ovary, was removed. Abdomen irrigated and closed by suture, a strip of gauze being inserted for drainage. The patient was out of bed at the middle of the fourth week and was discharged cured December 25th. Fœtal villi found on microscopical examination.

Case V.—R. L., aged thirty-three years; married; five children; three miscarriages. Menstruation regular and no complaint of pain until present illness. Last normal menstruation October 11, 1892. Skipped period in November; breasts swollen; suspected pregnancy. December 13th, severe cramp-like pains in right side, followed by expulsion of large clots from vagina. Patient remained in bed; had fever, and flow continued. Admitted to the hospital December 19th, complaining of severe pain in right side; temperature 101.5°; pulse 100. On examination a doughy, tender mass the size of a fist felt to the right of the uterus, which was immovable. Diagnosis—pyosalpinx or extrauterine pregnancy.

*Operation, December 12th.* Chloroform. Median laparotomy. Mass to right of uterus proved to be a distended Fallopian tube adherent to intestines and uterus. In separating it from the adhesions the tube ruptured and gave exit to an ounce or two of dark grumous blood and some organized tissue, which on microscopical examination was found to contain chorionic villi. Tube extirpated with ovary. Left tube found to contain a few drops of pus, also removed. A strip of iodoform-gauze inserted behind right broad ligament and brought out through abdominal wound, the remainder of which was closed. December 27th, gauze removed, rather foul. January 20th, patient out of bed. Sinus healed slowly and did not close until April 1st, but patient was discharged from hospital on February 10th.

Case VI.—R. Z., aged thirty years; married six years; one child; seven miscarriages. Had been curetted several times. Four years before suffered from an attack of pelvic peritonitis, which followed a severe uterine hemorrhage. Since that time menstruation regular and no complaint of pain until present illness. August 15, 1893, another severe hemorrhage, and again followed by the use of the curette; in bed for a few days, but back at work in a week. Felt comparatively well until September 12th, when she was seized with severe pain in right iliac region, followed by a chill, fever, and sweating. These symptoms continued until September 30th, when she was admitted to the hospital; temperature 101.5°; pulse 114. Complained of pain and tenderness in right iliac region. Uterus retroverted and immovable. In right broad ligament a fluctuating tumor the size of a large orange; a smallar one on the left. Diagnosis—extrauterine pregnancy. October 1st to 10th, temperature ranged between 100° and 102°. From the 10th to the 17th it remained normal. From the 18th to the 26th it ranged between 99.5° and 100.5°. Constant pain in right side.

*Operation, October 26th.* Chloroform. Trendelenburg position. Median laparotomy. To left of uterus a mass the size of a cocoanut found firmly adherent to uterus, to walls of pelvis, and to intestines, and which apparently consisted of a distended broad ligament. Rupture occurred in separating the adhesions and eight ounces of offensive bloody fluid escaped. Left Fallopian tube enlarged, and, with the ovary, removed, two clamps being left on the pedicles. Cavity cleansed, packed with gauze, and abdominal wound partly closed. Considerable shock followed, but patient rapidly rallied. November 2d, packing removed; convalescence uninterrupted. November 20th, out of bed. December 2d, discharged cured.

Case VII.—E. B., aged twenty-three years; married two years; never pregnant. Menstruation always painful and rather irregular. Since marriage more or less sense of discomfort in right inguinal region. During the spring and summer of 1893 continuous pain in this region. August, 1893, on examination I found a mass to right of uterus and adherent to it the size of a billiard-ball and very sensitive. Last regular menstruation in end of July. September 15th, slight bloody vaginal discharge; mass increasing in size. November 1st, pain more severe; mass larger, very tender; occasional "flow;" breasts tender; some vomiting. Diagnosis of intra-ligamentous cyst, and operation advised. Patient losing flesh and strength rapidly; no fever. For the next two weeks pain and tenderness increased and general condition worse. No further flow. Possibility of extrauterine pregnancy considered, but diagnosis inclined to tubercular salpingitis.

*Operation, November 14, 1893.* Chloroform. Trendelenburg posture. Median laparotomy. To the right of uterus spongy mass the size of a goose-egg, consisting of Fallopian tube, ovary, and broad ligament, surrounded by firmly adherent intestines. With considerable difficulty and much hemorrhage entire mass extirpated piecemeal, as it was so brittle and so adherent. Many ligatures employed. Tampon of gauze placed in the cavity from which the tumor had been removed. Abdomen partly closed. On examination mass consisted of enlarged and much-thickened tube, of part of broad ligament, and remains of fœtal tissue. Considerable shock. Slow convalescence. Discharged December 17th, with deep, narrow sinus, which persisted for months.

Case VIII.—J. M., aged thirty-one years; married; three children; one miscarriage; last child three years ago; miscarriage eleven months ago, followed by a curetting of uterus. With these exceptions no complaint of pelvic pain or history of disease in pelvic organs. Last regular menstruation January 10, 1894. Skipped period due on February 8th. Morning nausea and fulness of breasts. Considered herself pregnant. No pain and no flow until March 10th, when after a hard day's work felt severe colicky pain in right iliac region and noticed a slight show. Remained in bed twenty-four hours, when pain ceased, and again moved about the house, but complained of a sense of discomfort in the right side of pelvis. March 18th, another attack of pain, not very severe, and described as "tearing" in character; a slight bloody vaginal discharge accompanied the pain, and as these continued she consulted Dr. S. Graber, who made the diagnosis of extrauterine pregnancy and sent her into the hospital for operation. Admitted March 23d, temperature 99.5°; pulse 90; abdomen not distended and not tender except on deep pressure in right iliac region, where, on vaginal examination, was felt a boggy mass to the right of the uterus the size of an orange, and it seemed adherent.

*Operation, March 24th.* Chloroform. Trendelenburg position. Omentum adherent to fundus of uterus and to top of right broad ligament. Uterus enlarged, position good. In right broad ligament a semi-fluctuating mass the size of an orange, somewhat adherent to floor of pelvis and to small intestine. In endeavoring to enucleate this tumor it ruptured and gave exit to an ounce or two of semi-solid blood and a small oblong solid mass of organized tissue, which was afterward found by the microscope to contain chorionic villi and remnants of a fœtus. The sac consisted of the layers of the broad ligament, with an enlarged and ruptured Fallopian tube forming the roof. The latter, with the ovary, was removed, the cavity carefully cleansed, the layers of the broad ligament sutured, and the abdomen closed. Convalescence uneventful. Out of bed on the twentieth day, and discharged cured on April 20th.

Case IX.—A. S., aged twenty-eight years; married ten years; never pregnant. Menstruation normal, slight pain. Eight years before, mild attack of pelvic peritonitis. Since then six or eight similar attacks, the last one a year ago. Last normal menstruation February 15, 1894. Skipped period in March and considered herself pregnant. April 10th, severe cramp-like abdominal pain, especially in left inguinal region, followed by slight "flow." The pain increased in severity, the abdomen became very sensitive, and the flow continued. On April 18th she was admitted to the hospital. Temperature 99.5°; pulse 100. On examination a doughy mass, sensitive to pressure, was felt behind the uterus, which was crowded forward and to the right. Abdomen slightly tympanitic and tender. Diagnosis—probable extrauterine pregnancy.

*Operation, April 20th.* Choroform. Trendelenburg position. Median laparotomy. To the left of uterus and behind it a mass the size of a duck's egg, adherent to floor of pelvis and to intestines. In separating this a rupture took place and a blood-clot with some shreds of tissue escaped. The Fallopian tube was enlarged and adherent to the right wall and roof of the sac, which, with the tube and ovary, was removed. Several silk ligatures used. Cavity cleansed. Abdomen closed without drainage. Convalescence rapid. Out of bed on the twenty-first day, and discharged cured May 19th.

CASE X.—M. B., aged thirty-five years; married seven years; one child five years ago. No miscarriages. Menstruation has always been regular. Has complained of no pain in pelvic organs until present illness. Last normal menstruation in the middle of February, 1894. At next menstrual period, March 15th, the flow was very profuse and continued for twenty-five days and was accompanied by dull pain. This was followed by a foul vaginal discharge which continued until May 1st, when she was seized with a uterine hemorrhage and was taken to a hospital, where for ten days she suffered from frequent vomiting, severe abdominal pain, and tympanites. On May 12th there was sudden attack of severe pain in the right inguinal region, followed by vomiting and collapse. A foul vaginal discharge persisted, until June 1st, when, being somewhat improved, she was removed to her home. On July 9th she was admitted to the medical side of this hospital. Abdomen was swollen; she vomited frequently and suffered from more or less constant abdominal pain. On July 17th she was transferred to the surgical division for operation. Abdomen much distended, giving on palpation a feeling of irregular bogginess, especially to the right of the median line, where in the lumbar region could be felt a hard mass which proved to be a fœtus. Temperature 100.5°; pulse 100.

*Operation.* Chloroform. Abdomen opened by median incision. Omentum adhered to abdominal wall and to the agglutinated intestine beneath. On separating adhesion a large quantity of dark blood poured out, and the peritoneal cavity was found to contain an enormous quantity of blood, both in clots and fluid, certainly as much as could be contained in a two-quart measure. Clots were adherent to the intestines, and as they were removed considerable bleeding followed. The mass which occupied the right half of the abdomen was a fœtus, with its placenta apparently encysted among adherent intestines. The placenta was implanted partly on intestines and partly on the lower border of the liver. The head of the fœtus was pressed against the under surface of the liver. The hemorrhage following the separation of the agglutinated intestines was severe. The live fœtus was rapidly removed and the cord clamped. As there was no sign of cessation of the hemorrhage, which was venous and seemed to issue from all parts of the sac, the placenta was rapidly separated from its attachments and removed. This was accompanied by a tremendous hemorrhage, which was controlled by strong compression with gauze-pads, and by a few clamps which grasped the large veins. The right tube, enlarged and thickened, was removed. The abdomen was irrigated with hot water. Numerous gauze-strips were used as packing to control the bleeding, with the ends projecting through the abdominal wound, which was then partly closed. The loss of blood had been excessive and the shock was profound, but the patient rallied well, and at the end of forty-eight hours was in fairly good condition. The gauze was removed on the fifth day and the patient was out of bed at the end of the fourth week, and was discharged cured September 9th. The fœtus moved and breathed vigorously; it was apparently about six and one-half months old. The head was deformed and both legs were crooked. It was not placed in an incubator, and died at the end of a few hours.

Case XI.—K. K., aged thirty-two years; married eleven years. Never pregnant. With exception of an attack of pelvic pain five years before, no complaint of uterine or ovarian trouble until present illness. Last normal menstruation July 8, 1895. July 15th, seized with severe pain in pelvis which continued for two days. August 6th, bloody vaginal discharge for six days, accompanied by slight pain. August 20th, attack of severe pain and return of "flow." Pain and flow continued more or less constantly until her admission to hospital on September 12th. Pain described as cramp-like, mainly on right side. Temperature 100° to 100.5°; pulse 80 to 100. On examination moderate abdominal distention and a boggy, ill-defined mass was felt extending out of pelvis well above its brim and as high as the right anterior superior spine of ilium. Diagnosis—probable extrauterine pregnancy. Immediate operation advised, but refused. During following five days evening temperature ranged between 100° and 101°; pulse 100 to 120.

*Operation, September 17th.* Ether. Trendelenburg position. Median laparotomy. Intestines agglutinated to each other and to the mass, which, the size of an orange, occupied the right iliac fossa, and was attached to uterus and floor of pelvis, and apparently consisted of a distended broad ligament to which were adherent an enlarged tube and right ovary. Sac ruptured; an ounce or two of bloody fluid escaped. Tube and ovary removed. Cavity cleansed and in it was placed a gauze-strip, the other end projecting through abdominal wound, the remainder of which was closed by suture. Convalescence uneventful. Gauze removed September 21st. Patient out of bed October 16th. Discharged cured October 26th.

Report of Dr. Thacher, pathologist, states: "The Fallopian tube presents a dilatation one inch in diameter near its centre. This sac has ruptured and is filled with a solid blood-clot. Microscopical examination: Villi of the chorion."

Case XII.—D. S., aged thirty-seven years; married; three children. Last normal menstruation September 6, 1895, after which no sign of bloody vaginal discharge until the day of her admission to hospital, November 6, 1895. On October 25th she was seized with a severe attack of abdominal pain, chiefly located in the left iliac fossa, which was followed by leucorrhœa. On October 30th another sudden attack of pain, followed by syncope and vomiting. Great prostration and some abdominal pain and distention followed and continued until the morning of November 6th, when she was seized with a third attack, in which the pain was agonizing, the patient losing consciousness and continuing in a condition of collapse until her admission to the hospital in the evening of that day. In the ambulance during transfer to hospital she had several attacks of syncope in spite of active stimulation. On admission her radial pulse was almost imperceptible. Abdomen considerably distended and tender. By vagina the pelvis was found filled with a boggy mass. Diagnosis—ruptured ectopic gestation. Collapse, however, was so great that operation was for the present out of the question, as she would surely have died on the operating-table. During the night she rallied somewhat and on the next afternoon her condition was such that a laparotomy was deemed justifiable, as further delay probably meant a fresh hemorrhage. Under ether-anæsthesia in Trendelenburg position, the abdomen was rapidly opened. As soon as the peritoneum was nicked a spout of dark fluid blood spurted out, and on enlarging the opening it was found that the abdominal cavity was full of blood, both fluid and in clots. Two quarts at least of fluid blood were washed out and clots were removed in handfuls, certainly enough to fill another quart measure. After the greater bulk of blood had been removed patient was placed in Trendelenburg position, and to the left of the uterus was seen a mass as large as a small orange, consisting of an enlarged Fallopian tube, with a rupture in its wall, and a thin, semi-transparent empty sac, also ruptured. These were removed and clamps left on the pedicles. Peritoneal cavity washed out with gallons of hot salt-solution. Irrigation could, however, not be continued until the fluid ran out clear on account of the patient's condition. Gauze was packed into the left iliac fossa and a large glass drainage-tube placed in the pelvis, and the wound partially closed. The shock of the operation was great, but the patient rallied and on the following day was in fair condition, with a pulse of 140. There was a profuse discharge of bloody fluid through the tube. Temperature 99° to 101°.

*November 8th.* Temperature 100° to 101°; pulse 135 to 140. Free discharge of bloody serum Patient looks septic.

*9th.* Temperature 100° to 101.5°; pulse 130. Gauze-packing removed. Some vomiting.

*10th.* Temperature 100.5° to 102°; pulse 140. Several movements of bowels. Abdomen less distended.

*11th.* Temperature 100° to 102°; pulse 140. Patient weaker. No vomiting. Bowels moved.

*12th.* Died. Cause, exhaustion and sapræmia.

The pathologist reported fœtal villi in the specimens removed.

CASE XIII.—M. C., aged twenty-six years, married seven years; no children. One miscarriage at second month, three years ago, after which uterus was curetted. Since then regular menstruation and freedom from pain until present illness. Last normal menstruation August 15, 1895. At the time of next period, September 13th, sudden profuse hemorrhage lasting a day or two, and since then more or less constant bloody vaginal discharge. Cramp-like pains in the pelvis and occasional vomiting, which continued until her admission to the hospital on October 21st, when the temperature was 99.5° and pulse 120. Abdomen distended and very tender. Mass felt most prominent on the right side, extending out of the pelvis nearly as high as the umbilicus. Diagnosis—either extrauterine pregnancy or an abscess.

*Operation, October 22d.* Chloroform. Median laparotomy. Trendelenburg position. Bladder found adherent to the anterior surface of the tumor and to the agglutinated intestines as high up as the umbilicus. A catheter had been passed previously to the operation, but there remained more than a pint of urine in the bladder, which was opened before it could be separated from the mass, which separation was accomplished with considerable difficulty. Tumor as large as a cocoanut found to right of uterus, firmly adherent to broad ligament and to neighboring intestines. In separating this the sac ruptured and about eight ounces of bloody purulent-looking fluid escaped. Right Fallopian tube adherent to the sac and much enlarged, and near its centre was an old tear. It, with the ovary, was removed. On a loop of small intestine which had formed part of the sac-wall was a crater-like spot as large as a silver dollar, evidently the site of the placenta. Cavity sponged out, a strip of gauze packed into it and the end brought out through abdominal wound, which with this exception was closed. Patient suffered from considerable shock, but rallied well. Gauze removed on fifth day, and a fecal discharge indicated the existence of a fistula, most probably from a slough at the site of the placenta. With this exception recovery was uninterrupted. Fistula rapidly contracted. Fecal material ceased to pass on November 25th. Patient out of bed December 2d. Discharged cured December 14th.

Case XIV.—L. M., aged thirty-seven years; married; four children; one miscarriage. Last child two years ago. Menstruation had been regular and painless. No special complaint of pelvic pain until present illness. Last normal menstruation September 16, 1895. October 1st, complained for a few days of pain in left iliac fossa, not severe. Skipped menstruation which was due on October 14th. November 12th, after a slight fall felt severe cramp-like pains in left iliac region, and twenty-four hours later there was a sudden gush of blood from vagina. The pain continued for several days, and there was occasional vomiting. She suspected that she might be pregnant. November 13th, another attack of severe pain accompanied by a "flow," which latter continued more or less constantly until her admission to the hospital on December 13th. The pain continued for a few days, and afterward she was comparatively comfortable until December 7th, when she was again seized with severe pain and pregnant-vomiting. This continued until December 12th, when she was seen by Dr. Forbes Hawkes, who made the diagnosis of probable extrauterine fœtation which had ruptured, and he advised immediate operation. Temperature 101.5°; pulse 110. On admission, December 13th, temperature 100°; pulse 98. On examination a boggy mass was felt in Douglas's pouch about the size of a fœtal head. Just above and under the symphysis a solid mass the size of a hen's egg. Diagnosis—extrauterine fœtation which had ruptured into abdominal cavity.

*Operation, December 13th.* Ether. Trendelenburg position. Median laparotomy. On opening peritoneum considerable blood, both fluid and clots, found in its cavity. Omentum adherent to pelvic mass, easily separated. In median line under symphysis pubis and projecting toward the left side, a firm tumor the size and shape of a short, thick sausage. To its left, apparently on top of broad ligament, a thin sac the size of a hen's egg Uterus pushed over to right side of pelvis. In Douglas's pouch, surrounded by adherent intestines, a soft mass the size of two fists. The sausage-shaped tumor above the symphysis found to be a distended Fallopian tube (left). It was removed, two clamps being placed on pedicle. During this extirpation the sac to the left ruptured and an ounce or more of bloody fluid escaped. This sac apparently consisted of a distended portion of the left broad ligament and was afterward removed. The mass in Douglas's pouch consisted of black blood-clots enclosed in a fragile sac, through the wall of which some leakage had apparently occurred. The clots were scooped out by the hands. The table was then lowered and the abdominal cavity irrigated with gallons of hot salt-solution until it ran out comparatively clear. A large amount of blood was thus washed out. The pelvis was again elevated, the pedicle and a few bleeding points in broad ligament and omentum ligatured with catgut, one clamp remaining. A strip of gauze was packed into Douglas's pouch and brought out through the abdominal wound, the upper half of which was closed by suture. On opening the tube it was found to be distended with a firm mass of clotted blood. The distal end was open and led into a cavity about the size and shape of the last two joints of one's index-finger, the walls of which were composed of solid blood-clots. Considerable shock followed, and on the following day condition of patient was serious. Temperature 103°; pulse 130. Frequent vomiting.

*December 15th.* Temperature 102½°; pulse 120.

*December 16th.* Temperature 101½°; pulse 110. Gauze removed.

Convalescence uneventful. Out of bed January 12th. Discharged cured January 27th.

CASE XV.—A. B., aged thirty-nine years; married; two children; no miscarriages. Menstruation had been regular and painless, and no complaint of pelvic pain until present illness. Last regular menstruation December 20, 1895. Menstruation in January probably skipped. February 21st, menstrual flow appeared. February 22d, while sitting on a privy-seat was suddenly seized with severe abdominal cramps and vomiting, accompanied by profuse vaginal hemorrhage. Abdomen became swollen and tender, and cramps continued. There was some evening temperature, and vomiting was frequent. The vomiting, pain, and distention increased until March 26th, when she was seen by Dr. J. C. Jay, who made a diagnosis of peritonitis. I saw her on the same day, and we decided that her condition would not justify an operation. Vomiting was constant; pulse 130; temperature 103°; no movement of bowels for five days. Probable diagnosis—ruptured extrauterine fœtation. Abdomen very sensitive, but by vaginal examination could be felt a boggy mass filling the pelvis and extending upward to near the umbilicus. Under Dr. Jay's care gradual improvement until April 25th, when he deemed a laparatomy justifiable. The mass extended well out of the pelvis and on the right side above the anterior superior spine of ilium. Pulse 110; temperature 100° to 100½°; stomach very irritable.

*Operation.* Chloroform. Median incision below umbilicus. Peritoneum incised superior to mass, which was shut off from general peritoneal cavity by adherent intestines, and was adherent to anterior abdominal wall. Peritoneum closed by suture, and incision extended downward. Bladder adherent to anterior surface of tumor, pushed downward. Under peritoneum blackish-green mass. Peritoneum opened and large quantity of dark blood, fluid and in clots, poured out. Hand scooped out clots and a three months' fœtus, with cord and placenta, which was easily separated. Total amount more than two quarts. The cavity, the roof of which was formed of agglutinated intestines, was irrigated and drained with tube and gauze. During the first week there was much vomiting and development of urinary suprapubic fistula. Otherwise convalescence was uneventful. Discharged cured June 16th.

# ON THE TREATMENT OF ANEURISM BY ELECTROLYSIS THROUGH INTRODUCED WIRE: REPORT OF A SUCCESSFUL CASE.

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In a paper by one of us (Stewart) recently[1] the unquestionable advantage of combining electrolysis with the introduction of wire, in the treatment of sacculated aneurism not susceptible of cure by medical treatment or by time-honored surgical means, was fully set forth. It was remarked as evident that the employment of galvano-puncture alone, however perfect the technique, had beyond doubt proved a failure in the therapy of aneurism. The introduction into the sac of filiform material, but especially of wire (Moore's operation), was shown to offer much to recommend it. The literature of the subject was then carefully surveyed in the paper, and individual cases in which wire had been used were analyzed. The conclusion seemed apparent that, given a proper subject, with proper technique, little risk attended the method and much promise of benefit. It was pointed out that failure in several of the cases reported lay in the direction of improper technique, such as the use of too great a quantity of wire,[2] and to the occurrence of septic complications, as in Moore's case.[3] These, present knowledge would lead us to avoid. The fact that in most of the cases the operation was undertaken as a forlorn hope, with the aneurism on the point of rupture, had also to be borne in mind, for it was apparent in nearly all of the fatal cases that any other issue was scarcely to be expected. As concerns result, Loreta's case and Morse's[4] plainly showed the great promise of the method when other conditions were also propitious for cure.

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[1] The Treatment of Sacculated Aortic Aneurism by Electrolysis through Introduced Wire. AMERICAN JOURNAL OF THE MEDICAL SCIENCES, October, 1892.

[2] In Moore's case 108 feet of wire were introduced, and in Cayley's, 75 feet.

[3] Death here occurred from pyæmia.

[4] In Loreta's case an abdominal aneurism, the size of a fœtal head at term, contracted to the dimensions of a walnut, with obliteration of the sac-cavity, by the seventieth day after the introduction of two yards of silvered copper wire. Death resulted subsequently from rupture of the aorta below the sac. In Morse's case it is stated that eight weeks after the insertion of one and a half yards of one-half millimetre silver-plated copper wire into the sac of an abdominal aneurism the size of two fists, all indications of aneurism had disappeared, a hard nodule replacing the pulsating tumors. The patient remained well.

Electrolysis combined with the introduction of wire, by which a strong galvanic current is conducted through coils of the same filling the sac, was shown to be an incomparably superior method of promoting prompt coagulation to the use of wire alone. Apart from the harmlessness of the procedure, its advantages over the use of wire without electrolysis consisted in that "instead of a soft, unstable coagulum about the wire, tardy in appearing, there may be produced almost immediately a tough clot, which, in favorable cases, should tend by accretion to produce prompt obliteration of the sac-cavity." Over mere galvano-puncture the superiority lay, as was remarked, in that in the former, if the wire were properly disposed, a firm coagulum, perhaps completely filling the sac, might be expected to occur promptly, instead of a few small nodules at the periphery which would have little effect upon a large mass of circulating blood.

The seven cases then on record were analyzed and a new one reported. It was shown that these scarcely bore collective review. Burresi-Corradi's case—a thin-walled, rapidly growing aneurism—had been regarded as utterly hopeless for any treatment prior to operation, as were those of Barwell, Roosevelt, Abbe, and my own. In another of the seven the sac was fusiform in character, and not, as remarked, suitable for the application of the method. In several the technique employed was most faulty. Far too much wire was used in two than could have been productive of ultimate good.[1] The current-strength and the polarity employed in several were not mentioned. In these it seemed likely that the former was insufficient and the second scarcely the best. In Abbe's case, which had been regarded as utterly hopeless prior to operation, it was still unfortunate that a beneficial current of 50 milliampères anode for a half hour should have been succeeded by one calculated to soften rapidly and separate the clot so induced—100 milliampères cathode the second half hour. On individual study of these cases it appeared obviously unfair to hold that the operation was of slight promise because of the seven cases but two were cured. From the evidence these two were the only ones susceptible of cure.

In the senior writer's case the aneurism was of enormous size, showing advanced pressure-symptoms. A large part of the sac-boundary consisted no longer of arterial tunics, but of eroded ribs and vertebræ, and in the situation of the bodies of several of the last which had been largely absorbed lay spinal cord protected only by its membranes and by clot. In this case the operation had been attempted rather as a means of euthanasia than with idea of cure. Intense suffering from nerve- and bone-pressure rendering constant use of anodynes necessary was hoped to be obviated for a time through the formation of supporting coagula. This case proved fatal on the ninth day succeeding operation, an indiscretion on the part of the patient causing rupture of the sac in a section of the aneurism some distance from the wire or the clots that engaged it. The enormous size of the sac had precluded the possibility of complete solidification by clot. In this case, as with all of the others in which the conditions were at least moderately favorable for clot-formation, decided evidences of this were evident soon after operation. A necropsy, when obtained, strikingly demonstrated the value of the method.

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[1] In Roosevelt's, 225 feet of wire were introduced; in Abbe's, 150 feet, nine days after the insertion of 100 feet of catgut.

It has since been Dr. Stewart's good fortune, through the kindness of his collaborator, to repeat this procedure. In the present case, here reported, there was a large and rapidly increasing innominate aneurism. Its anterior surface was unprotected by clot, and indications of early rupture were very evident. The patient's condition was most unfavorable otherwise. He was an inmate of Blockley; had been for years of dissipated habits and had had syphilis. There were evidences of advanced nephritis, of greatly enlarged heart and of badly damaged aortic leaflets. Blood-pressure was persistently high and utterly uninfluenced by large doses of potassium iodide.

Although an absolute cure[1] was here scarcely to be expected for these reasons, the result obtained well illustrates the usefulness of the method in promoting clot-formation, its innocuousness, and the benefit which may accrue in a case the duration of the life of which was then regarded as ephemeral. The patient after a few weeks in bed has since steadily been about. The aneurism, although still somewhat prominent and pulsating, can be handled with impunity. It causes no obvious pressure-symptoms.

## History of the Case, by Dr. Salinger.

G. D., aged forty years; white male. Syphilis in 1881. Very severe attack of acute articular rheumatism in 1887. A heavy drinker since early manhood. For a number of years worked in lead, but no history is obtainable of plumbic poisoning. Has been a stonemason lately. This occupation necessitates great physical strain. Had a bad fall (from the second story of a house) in December, 1891. Was injured about the body and extremities. States that he also bruised the right side of the chest in the situation at which the aneurism developed a year later. In December, 1892, severe pain was first felt in the neck on both sides, but especially on the right. Paroxysmal cough, and slight, although continuous dyspnœa, also appeared. In April, 1893, he first noticed a swelling below and to the right of the right sterno-clavicular junction. This steadily increased in size. Admitted to the writer's wards, Philadelphia Hospital, June 23, 1893. The following was then also noted: Patient had dissipated appearance, suggesting a heavy drinker. Face

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[1] A cure as concerns complete obliteration of sac.

swollen, cheeks flushed, conjunctivæ injected. Dilated venules on face and upper extremities. Right pupil smaller than the left. Chest fairly well developed, Aneurismal swelling extends from the middle of right clavicle to left sterno-clavicular junction and from upper border of the second rib to two inches above clavicle. The prominence is four inches in vertical direction, four inches in transverse, and three-quarters of an inch above the level of the sternum. Dulness appears at the centre of the right clavicle. Transverse measurement of dulness seven and three-quarters inches. Tumor in shape that of segment of circle, curve downward, with radius three and a half inches. Expansile pulsation over all parts of tumor. Thrill and bruit present and transmitted into carotids.

*Heart:* Apex-beat diffused; pulsation visible over large area; to palpation most apparent in sixth interspace, a half inch outside mamillary line. Marked double aortic murmur, the diastolic part of which is transmitted to apex. Typical water-hammer pulse absent. Little difference noted in the two pulses by finger or sphygmograph. Aneurismal character absent. Both pulses at times anacrotic, the left rather than the right shows tendency to complete obliteration of dicrotic wave, so common in aortic regurgitation. Both have usually great altitude of percussion-wave. Laryngeal examination negative. Patient has considerable cough, both dry and attended with expectoration. Sputum examination for tubercle bacilli and elastic tissue negative. Upper part right chest shows poor expansion, vesiculo-bronchial breathing, slightly impaired resonance. Blood-spitting occurs. Urine contains much albumin.

Patient placed on potassium iodide in ascending doses. Tuffnell's treatment was also adopted. Despite this aneurism rapidly increased in size. Rupture externally seemed imminent. Outlook apparently hopeless. Interference by deligation on the part of the surgeon on duty refused. Dr. Stewart invited to see the case with a view to treatment by his method of electrolysis through introduced wire.

## History of the Operative Procedure, by Dr. Stewart.

I concluded in this case to adopt practically the same technique as in the other case detailed in my first paper. In this instance, however, in which apparently better ultimate results might be expected, I choose for insertion, by preference, a finer wire. In my first case, as I have elsewhere remarked, "I concluded a better chance of immediate success lay in the introduction of wire of sufficient calibre to form large, supporting spirals in the sac, thus occupying considerable of its cavity, and affording a framework for clot, than in the use of a thinner, more pliant wire, which, though better calculated to permit of ultimate contraction of organized fibrin and sac-walls—apparently not to be hoped for here — might undergo deflection from its course in introduction through impingement on loose coagula already in the sac, thus perhaps rendering it necessary to repeat the process, which from the patient's enfeebled condition would have been impracticable." In the present case, with a much smaller sac, and one less likely to contain interfering clot, the interior of which, on all sides, could be reached by a few feet of properly drawn spirals, the ideal wire was one of as small a calibre as would, while maintaining its spiral shape, subsequently admit of coincident contraction with the large enveloping coagulum to be formed under the current's influence.

I had at first intended employing silver wire; but as difficulty then existed in obtaining it sufficiently firm of a suitable fineness, after consulting with Mr. Otto Flemming, I concluded to resort to gold wire, which latter seemed to meet better the indications. The chief objection to the use of gold wire, we agreed, lay in the fact that a greater strength of current was necessary to promote roughening of its surface, to induce the prompt coagulation about it desired. Iron wire was impracticable and even dangerous for use for the reasons fully cited in my paper, based on very convincing experiment. The wire was drawn hard to No. 30 gauge and so wound that when finally passed through the needle it formed separate spirals of moderate dimensions.

The procedure was carried out on July 27, 1893. Strict antisepsis was, of course, adopted. As in the other case, I determined upon the conjoint use of galvano-puncture, by means of several needles connected with the same rheophore as the wire, hoping thus better to secure an extensive coagulum from wire to needles and to sac-wall.[1] Two platinum needles of good calibre were first introduced toward the periphery of the sac. These were well insulated at their base to protect the skin. More than an inch penetrating into the aneurism was left uninsulated. About this from the wire to the sac-wall it was desired to promote clotting under the current's influence. One of the two needles after introduction could be freely moved about in the sac. Upheld after insertion it fell from the perpendicular to a horizontal position, showing how thin was the sac-wall in this position and that no supporting clot lay beneath it. The other, introduced at another point at the periphery several inches from the first, seemed less free, so that after a time it was withdrawn, blood flowing freely from the site of puncture. The receiving canulated needle was of as small a calibre as would admit the passage of the wire, and was insulated to its tip. This I introduced into the most prominent and central portion of the sac, at a point so thin-walled that blood spurted through the needle when penetrated to a depth of but a fifth of an inch. Blood continued to flow between canula and wire until the current was closed. Ten feet of wire were now slowly passed into the sac and the points of contact connected by the anode. A large clay plate forming the indifferent electrode, was placed upon the abdomen. Its position was changed from time to time without breaking the circuit. The current was, of course, controlled by a rheostat. The electrical outfit contributed by Mr. Flemming was in his care. The current was passed without interruption for seventy-five minutes. It was gradually increased to 30 milliampères in one minute to 65 milliampères in five minutes; to 75 milliampères in ten minutes and 80 milliampères in fifteen minutes, and maintained steadily at the latter point for one and a quarter hours. Both of the needles, which from their weight (the weight of the wire in the canulated one) tended to lay horizontal to the sac-wall unless upheld as they were, at the expiration of half an hour remained perpendicular without assistance, showing well the wonderful clot-forming power of this strength of current through the anode. Toward the end of the procedure it was generally remarked by all present that pulsation had quite markedly lessened over a large part of the sac. The patient was carefully watched by Dr. Salinger and myself during the operation. The procedure was well borne. No pain was felt at any time during it or subsequently, and there was no evidence of shock.

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[1] See my paper in THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES, October, 1892, p. 432.

## SUBSEQUENT HISTORY AND REMARKS. AN ACCOUNT OF A SECOND ATTEMPT AT INTRODUCTION OF WIRE WHICH DEMONSTRATED CLOT-FORMATION.

Slight oozing recurred from the site of one of the punctures for a few days subsequent to operation. It was controlled by iodoform collodion and the application of ice. Pulsation in the sac steadily diminished, and showed little of an expansive character by the end of the second day. Thrill, too, was then noted to have largely disappeared. The patient complained only of stiffness in the neck, caused by lying so long in one position. He swallowed fairly well. Respirations at first were stridulous, but later became normal. No elevation of temperature occurred. All who had followed the case noticed the decided lessening in pulsation in the sac, especially its lower half, through which the wire had been passed, and which previously had shown the most expansile movement. Potassium iodide was repeated after a time. It was thus hoped to assist in clot-formation through influence on blood-pressure. Later, for short periods, we also used calcium chloride in small doses, after Wright's method, measuring its effects upon blood-coagulability by the latter's apparatus. Little benefit was obtained from it; we found that even in small doses its effect early was to delay the onset of coagulation after ephemerally having had the opposite effect.

At the expiration of three weeks, although we agreed that the lower half of the aneurism had unquestionably diminished in size, become firm and no longer showed expansile pulsation, so marked a change in the upper portion was not apparent. It was evident that clot-formation had been induced, although its extent seemed limited. The patient's bad physical condition, from the arterial wall-changes evident, the damaged heart, and very incompetent kidneys, did not render the outlook promising. Blood-pressure was constantly abnormally high, and rupture in the upper segment of the sac seemed still to be feared for a reason mentioned by Dr. Stewart in his first paper[1] as the probable immediate cause of death in a certain number of cases in which filiform material was introduced, irrespective of any direct danger from injury by the material itself. The risk seemed to be "in consequence of the partial obliteration of the sac-cavity by former coagula resulting in rapidly raised pressure in an unprotected and weakened portion of the sac now exposed to a greater pressure than formerly." We regarded it as likely that the wire had only filled the lower segment, which was probably larger than we had supposed. Dr. Stewart thought it well to attempt to repeat the operation, if possible introducing more wire into the upper segment of the sac. This was the portion in which the platinum needle had been placed, which at first was totally unprotected, but which at the end of the electrical session showed decided evidences of coagulation.

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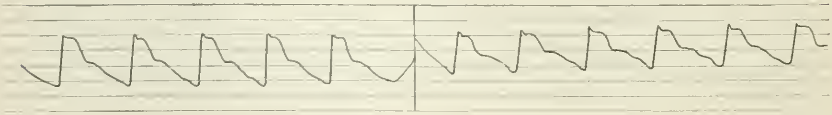
[1] Page 436.

Accordingly, four weeks after the first operation he inserted perpendicularly a canulated needle, an inch and a quarter in length, to its full extent, into this part of the sac, which now seemed the weakest and thinnest portion. No blood flowed at any depth, although the needle was inserted slowly. But one to two inches of wire could be forced into it, with most patient effort. The wire and finally the needle were withdrawn. Not the slightest oozing followed, nor was either needle or wire blood-tinged. An attempt was now made to pass the needle at another point which seemed from external evidences less protected. The result was similarly negative. No blood flowed, no wire could be passed, and the needle could be moved about only with difficulty in the previously fancied cavity. On the following day a needle of larger calibre, two inches in length, was tried by Dr. Stewart with similar result. This he thrust into the sac in two situations in a direction perpendicular to the surface as before. The new sites of puncture chosen were those in which the sac also seemed weak. Another attempt was also made by entering the needle near the upper base in a direction obliquely downward. In each instance the result was similar. No blood flowed at any depth penetrated (upward of two inches), and at no depth could more than two inches of wire be with difficulty thrust through the needle. This was a beautiful demonstration that consolidation had been effected in all parts of the sac, which other evidence had previously rendered doubtful. No oozing occurred after these multiple and deep punctures, and no ill result. The patient was soon after discharged from the hospital. He has been under observation to the present. Indications of chronic nephritis continue as before. The urine is constantly diminished in amount (averaging, in recent estimations, 800 c.c. in twenty-four hours); albumin is steadily present ($2\frac{1}{4}$ grammes to the liter); there is low urea ($12\frac{1}{2}$ grammes in twenty-four hours), and an abundance of granular, epithelial, and hyaline casts. Symptoms of renal inadequacy are common, although not decided. His habits are, as before, irregular He is about the streets, and still drinks freely of spirits when opportunity offers.

Despite these most unfavorable conditions the aneurismal tumor, although still prominent, has caused him no inconvenience for a long time. Pulsation is still evident, but is apparently a communicated one. No thrill is present in the aneurism, although one still persists in the carotids. Although clot-formation has unquestionably occurred, such complete subsequent organization of the mass necessary for final obliteration of the sac-cavity has probably been impossible because of the very bad physical condition and habits of the patient. The sac is, however, so well protected by clot that no direct or remote symptoms occur from the aneurism itself.



G. D., April 25, 1894; right radial, pr. 3 oz.; left radial, pr. 3 oz.; sitting.

Decided improvement has also occurred in the cardiac condition since the operation, presumably scarcely to be accounted for as a direct result of the change in the aneurism. The area of cardiac dulness is considerably less; the double aortic murmur is much diminished in intensity—the systolic bruit is now scarcely appreciable, and the diastolic not marked. The radial pulses are equal. The sphygmograms exhibit markedly the evidences of sustained high blood-pressure constantly present, the result of inadequate kidneys. The accompanying tracings well illustrate this.

Aneurismal character and evidences of the aortic valve lesion are now absent from the pulse.

*June 23, 1896.* Almost three years have now elapsed since the date of the operation (July 27, 1893). The patient, followed to the present, is in his usual health. Two quite small, soft areas are now apparent in the otherwise firm aneurismal sac, not present a few months previously. That he has lived so long, despite the ill-result of the extensive cardiac and renal disease, and his vagrant habits, on his general condition, with an aneurism of such dimensions is surprising. Such a result in what was so hopeless a case is most gratifying and suggestive.

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# COMPOUND DEPRESSED FRACTURE OF THE SKULL; ABSENCE OF UNCONSCIOUSNESS; PARALYSIS OF ONE-HALF THE BODY; OPERATION; RECOVERY.

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This case illustrates that consciousness may be unimpaired following an injury to the head severe enough to cause paralysis.

A boy, nine years old, was struck in the head by a brick falling from a height. He was seen immediately after the injury at the hospital and found to be conscious. He answered questions naturally. There was a large scalp-wound over the parietal bone and a little anterior to the parietal eminence to the right of the median line. The bone beneath the scalp-wound was fractured and depressed into the brain-substance. The left arm and the left leg were completely paralyzed to motion. The right pupil was dilated; sensation was present. The right upper eyelid drooped. There was a scar in the right cornea. Immediately after the injury the temperature was 96° F., the pulse was 74, the respiration was 26. When examined one hour after the accident the pulse had fallen to 68, he had vomited once, and had been somewhat nauseated.

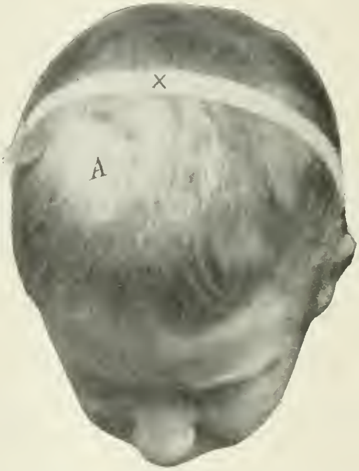
The operation of elevation of the depressed fragments of bone was done under ether. The fragments of bone removed were about the size of a silver half-dollar. There was no fissure in the skull. The dura mater was torn and the brain slightly lacerated. Upon elevating and removing the depressed bone hemorrhage occurred from the vessels of the dura mater. The depressed bone was not replaced. The dura was left open and the cavity was drained by a wick of gauze, which was removed upon the third day.

A few hours after the operation the boy was perfectly conscious as before the etherization, the pupils were normal, and motion had returned in the paralyzed limbs.

Three weeks after the operation a small, granuating wound remained and there was a slight tendency to hernia cerebri.

Four months following the accident the boy's condition is as follows: The wound is nearly healed and continues to discharge at times. He walks naturally. There is no paralysis of arm or of leg. No mental symptom is present.

The interesting and unusual fact in this case is that after a blow sufficiently severe to cause a depressed fracture of the skull and paralysis of one-half of the body the patient remained conscious.



Compound depressed fracture of the skull.
X. The mid-point between glabella and inion. A. Middle of depressed bone.

The exact location of the injury to the head and brain is shown in the accompanying photograph.

Note.—For a study of the interval of consciousness after head-injuries, see The American Journal of the Medical Sciences, April, 1895.

# DIAGNOSIS OF CHRONIC ABSCESS OF THE BRAIN.

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Chronic abscess of the brain may, for the sake of convenience of description, be divided into two varieties. The one is the result of acute or subacute focal intracranial suppuration in which the symptoms have become more or less latent; while the other begins with symptoms so ill-defined and unobtrusive as scarcely to attract attention, if, indeed, they do not escape observation entirely during the early stage of the morbid process. It would aid in preventing confusion in the study of abscess of the brain if all those cases that begin with more or less pronounced cerebral symptoms, and continue with unmistakable and progressive signs of brain-disorder, were regarded as acute or subacute, no matter what may be the duration of their course. It may be argued that it would be more definite to call those abscesses of the brain that begin with acute or subacute symptoms, and are followed by a latent period, as latent, leaving the term chronic to apply only to those whose early period is insidious. It does not matter much which course is followed so that it is distinctly understood what is meant to be conveyed by the word chronic as employed to designate certain varieties of abscess of the brain. A chronic abscess is essentially latent from its commencement to the beginning of its terminal period, and the so-called latent abscess is usually one whose duration is more or less prolonged. An abscess of the brain whose early symptoms have been so unobtrusive as to place it in the category of the chronic variety may run a much shorter course than the one ushered in by pronounced symptoms and followed by a latent period.

Wide differences of opinion are held to-day by physicians and surgeons of recognized ability regarding the difficulties encountered in the diagnosis of chronic abscess of the brain. Much of this discrepancy is due, it seems to me, to many accepting all intracranial suppuration as the result of an acute process. At the Surgical Congress held in Berlin April 17, 1895, the distinguished surgeon, Professor von Bergmann, in a paper entitled "Progressive Cerebral Surgery," stated: "Cerebral abscess must always be operated on. Its diagnosis is easy if the etiology is considered. The principal cause of cerebral abscess is inflammation of the middle ear; it is usually situated in the temporal lobe." Leube, than whom few have attained to greater distinction as careful and painstaking diagnosticians, says: "The diagnosis of subacute and chronic abscess of the brain is, on the whole, easy." According to Professor Murri: "He (Leube) gives the most important indications of cerebral abscess, intermittent fever associated with rigors, and attributes great value to the absence of optic neuritis and etiological considerations." (*Lancet*, January 12, 1895).

Gowers, in his work on *Diseases of the Nervous System*, begins the paragraph on diagnosis of cerebral abscess with "The extreme variability and frequent latency of the course of cerebral abscess often render its diagnosis difficult and even impossible."

Spitzka, in Pepper's *System of Medicine*, after making the statement that "there is little difficulty in recognizing the existence of cerebral abscess in which well-marked focal and constitutional symptoms coincide, or where a distinct abscess-producing cause, such as an ear-trouble, a head-injury, or a putrid bronchiectasis, coexists, adds, "but there are a number of cases, varying from the latent form to forms with obscure general symptoms, whose recognition is impossible or at best a matter of conjecture." (Vol. v. p. 799.)

Professor Murri states that Martius has made a study of seventeen cases of cerebral abscess occurring in the German hospitals during the past few years, and not one of them was recognized during life (*Lancet*, January 5, 1895, p. 12). I might continue at great length to quote from various writers concerning the difficulties of recognizing, during life, chronic cerebral abscess, and I might add mistake after mistake in diagnosis, not a few of which would be my own, but I have no need to extend my remarks in this direction, as you are aware, I have no doubt, from personal experience, of the uncertainties attendant upon the diagnosis of intracranial suppuration, especially of the chronic variety. I do not wish to underestimate the difficulties that are sometimes encountered in diagnosticating acute cerebral suppuration. These not infrequently prove insurmountable, but they are, on the whole, less than are met with in diagnosis of chronic abscess. Many of our text-books are content with a description of abscess of the brain, as though it always originated in acute cerebral suppuration.

The importance of recognizing the essential difference between acute abscess and chronic abscess of the brain will justify a rather lengthy quotation from Professor Murri's admirable "Address on Experimental Craniotomy and Diagnosis of Cerebral Abscess" (*Lancet*, January 12, 1895, p. 79):

> "Abscess of the brain, which, when clinically considered, seems to be an essentially unique morbid process, resolves itself into two varieties which differ utterly in diagnosis, viz.: acute abscess and chronic abscess. Writers aiming at the unity of the process lose sight of the clinical side, and do not bring into sufficient relief the practical differences which exist between the two varieties. What they say of abscess applies chiefly to the acute form. Bacterial analysis might throw more light on the causes of the differences

which are developed in the process of suppurative inflammation of the brain. At present what we chiefly know is the intensity of the exciting causes; the duration of the process depends much on these. If a considerable cerebral artery is closed by an embolus; if a wound on the head causes disturbance, contusion, or hemorrhage in a zone of the brain; if a suppurative otitis media violently affects the bony substance and gives rise to a thrombus in the cranial sinuses, or excites inflammation in the adjacent meninges, the nutritive process of the cerebral tissues near cannot avoid deterioration, the pyogenic agents find a field well prepared, and their devastations are in consequence very rapid. But here, besides the rapidity of the disease, there arises another clinical distinction. These occurrences, being more intense, cannot easily happen without being perceived by both the patient and his medical attendant. Moreover, the succession of phenomena aroused by them is not so disconnected as to lose the evidence of their reciprocal relation and the unity of the process they reveal. Finally, even the reaction of the brain provoked by rapid and great intracranial changes is more evident and appreciable to the practitioner. If to all this we add that the rapid diffusion of suppuration causes fever, and even a special fever, as a phenomenon revealing the nature of the morbid process, then it is easy to comprehend how the clinical idea assumes a form so distinct that the diagnosis of acute abscess naturally follows.

"When we come to the chronic forms of cerebral abscess, the description and opinions of pathologists inspired by the observation of such facts no longer correspond to the facts themselves. In these the exciting causes are less intense or less apparent. It is one thing, for example, if an embolus from a pulmonary vein closes the artery of Sylvius, and another if pus penetrate unperceived into the brain by one of those narrow ways which lead there from without. The slightness of the latter is not only marked by the absence of disorders perceptible to the patient, but it also causes a slower succession of changes around itself; the surrounding tissues, not previously affected and violently attacked, have time to organize themselves for the defence, and in time circumscribe with a solid barrier (pseudo-membrane) the hostile element (pus) which tends to destroy it. This mysterious faculty which the brain possesses of adapting itself to the most serious lesions as long as they are gradual has full opportunity to act completely. Thus it follows that, from ignoring or forgetting the primary cause, it seems as though no external cause exists; and here we have the idiopathic abscess, which is almost always chronic. Even where the primary cause is known, if it be not violent, the process which succeeds follows with less rapidity, and hence the slight changes of the brain may not arouse perceptible functional disorders. Here we have the latent abscess or the latent period of the chronic abscess. The slowness with which brain-alterations proceed proves that a length of time is required for their development, and here we see the abscess become chronic. The perception of these internal processes is often defective, as is frequently seen in the doctrinal works of the pathologists and in the reasoning of clinical physicians who write and think of cerebral abscess as though it existed only in the acute form. But the abscess exists also in the chronic, idiopathic, latent, or semi-latent form, and this, though less frequent than the acute, is by no means as rare as statistics would make us believe."

A small number of cases of chronic cerebral abscess, from their inception to the beginning of the terminal period, and a few others in their most latent stage, may not present pronounced symptoms of organic brain disease until there are manifestations of the terminal period, but a careful study of cases of obscure brain diseases will reduce this number to a minimum. The symptoms of abscess of the brain are common to several forms of organic brain disease, and a correct interpretation of them will depend upon the experience, diagnostic skill, and thoroughness of the medical attendant. Professor Murri's precaution to bear in mind the possibility of the presence of chronic cerebral abscess in investigating cases of obscure brain disease might be advantageously observed by all. The frequency of this form of cerebral abscess is not great, but the presence of chronic cerebral suppuration is too often overlooked for the credit of medical science or the welfare of the unfortunate sufferer.

Conclusions reached by an analysis of the most accurate history may, in some cases, lead from the truth; but in the vast majority of instances information thus obtained, together with a thorough examination of the mental and physical condition of the patient, when all the modifying circumstances of the case are carefully considered, will greatly aid in arriving at an accurate diagnosis. Not infrequently the history of some condition that is known to be favorable to abscess-formation in the brain will be obtained from the patient. Months, and in rare cases years, may have elapsed since the cause was apparently active, and at the time of the examination it may have been forgotten both by the patient and his friends, and memory of it is only revived by a careful and intelligent line of questioning. It may have been a blow on the head; a fall from a height and lighting on the feet or buttocks without striking the head; a painful condition of one or both ears, either with or without otorrhœa; suppuration in some portion of the body; or some exhausting disease, possibly influenza, diphtheria, rheumatism, or typhoid fever, from which recovery has never seemed complete. In typical cases the history will develop the fact that headache, intermittent or constant, has been a prominent feature for a greater or less part of the time that has occurred since the time of the illness that left the patient's health impaired. In some cases irregular febrile phenomena, dimness of vision, vertigo, failing nutrition and strength, and sometimes mono-spasm, mono-paresis, hemiplegia, or general convulsions have been experienced. In the majority of instances, on examination of persons suffering from chronic cerebral abscess, we shall find evidence of organic brain disease; but occasionally the patient may present a vigorous appearance, and death may occur without warning, as was the case in Professor Murri's experience (*Lancet*, January 12, 1895, p. 80). The most careful and exhaustive examination of the motor apparatus and of the general sensory phenomena may yield negative results. The reflexes may be normal or slightly exaggerated. If the motor cortical areas or the motor tracts of the brain are affected, either directly or indirectly by the abscess, symptoms of paresis, paralysis, or muscular rigidity will be present, corresponding to the extent and situation of the abscess and the softening resulting from its presence. Nutrition and muscular strength usually fail in the course of the disease, but in some cases these are unimpaired. Mental failure, especially slow action of the mental faculties, and difficulty in maintaining mental concentration for a length of time, and lessened power of memory, together with irritability of temper, are not infrequent results of chronic cerebral abscess. Recurring convulsions, sometimes mistaken for those of idiopathic epilepsy, are occasionally found in cases whose other symptoms of cerebral disease are most obscure.

INDIVIDUAL SYMPTOMS. Among the special symptoms of chronic abscess of the brain headache is the most important. Its significance is that its beginning dates from exposure to certain conditions that are known to be capable of giving rise to abscess of the brain. It is rarely constant, but there are very few cases of this disease in which headache has not been more or less pronounced during some portion of their course. At times the headache is severe, and at others it amounts simply to a dull or uncomfortable cephalic sensation. In some instances the headache, if present at all, has been so slight as to escape attention entirely. When the terminal period, caused by softening, œdema, or extension of the abscess, is reached, headache, even if absent before, often becomes a very prominent symptom, and its severity marks the beginning of the end. The seat of the pain does not always correspond to that of the abscess. If the terminal period is short and the symptoms tumultuous, the obscured consciousness often prevents any voluntary complaint of head-pain being made, although, even in such rapid cases, if the patient can be aroused and his attention engaged for a few moments, the fact that headache exists can, not infrequently, be obtained from the patient in answer to a direct question. The typical temperature of chronic abscess of the brain, if the morbid process is sufficiently large to exert much depression, is normal or slightly subnormal. At times there may be slight intermittent febrile processes which are frequently attended by cool and clammy perspiration. Optic neuritis, when present, is a symptom of great importance. Some observers seem inclined to think that it is of infrequent occurrence, while others have observed it in a sufficiently large proportion of cases to regard it as a valuable aid in the diagnosis. In the cases that I have observed it has been present more frequently than absent, but the extreme degree of swelling so commonly seen in association with tumor of the brain I have not observed as a symptom of abscess.

*Terminal period.* This period may extend over several weeks or a few days, and, possibly in some cases, may last only a few hours. Its duration depends upon the manner in which the abscess causes death. The latent period may end suddenly by the abscess bursting into the lateral ventricles and giving rise to all the symptoms of intra-ventricular hemorrhage. The rupture may occur on the surface of the brain and cause local, or, more commonly, general lepto-meningitis, which proves rapidly fatal. When the pus finds its way to the surface of the brain in the posterior fossa, both by the meningitis and the direct irritation of the pons and medulla, the cardiac and respiratory centres are interfered with. In the latter case, if the patient survives the shock, the symptoms will be those of cerebro-spinal meningitis, prominent among which will be retraction of the head, rigidity of the muscles of the back of the neck, and sometimes of the spine, with manifest opisthotonus and shock-like convulsive rigidity of the muscles of the limbs, especially of the arms. Œdema and softening of the brain-substance are the causes of death in about one-half the cases of abscess of the brain. In many of these in which the motor and sensory areas of the brain are not especially affected, either directly or indirectly, by the abscess, the softening may take place so gradually that no symptoms of it may be detected until sudden collapse or death results from the apparent arrest of cerebral function. It is probable, however, that if these cases that end suddenly from softening and œdema were carefully watched, symptoms of failing brain-power and general vigor, together with increased headache, irritability of temper, and a tendency to depression, might be detected weeks before the fatal end. In all the cases of chronic abscess of the brain except one which have come under my observation during the terminal period the symptoms of this stage have developed in a subacute manner. The prominent symptoms have been headache, usually dull and heavy in character, but at times attended with severe paroxysms of pain, failure of nutrition, energy, and strength; mental dulness and slowness, and irritability of temper; vomiting only when associated with severe paroxysms of pain in the head; optic neuritis in a number of instances; slow or normal pulse when the patient is quiet, but sometimes easily accelerated by exercise; subnormal temperature in nearly every case; convulsions occasionally at the beginning or ending of the terminal period; paralysis, usually hemiplegic in character, or paresis, with rigidity of the affected muscles from pressure on the motor fibres of the brain, in more than one-half the cases, and in a number hemianæsthesia with hemianopsia. As the terminal period progresses the symptoms increase in gravtiy; the sensory functions become more and more blunted, the patient's apathetic condition increases, and finally stupor, followed by coma, sets in, and the patient dies after remaining unconscious several hours to several days. It is rare after symptoms of the terminal stage become prominent for the patient to show more than temporary improvement.

Localizing Symptoms. Percussion has afforded me little or no aid in diagnosticating a chronic abscess. The localizing symptoms of abscess of the brain may vary from those of tumor because pressure-symptoms are sometimes less marked in the former than in the latter, and on account of the more complete destruction of tissue and greater œdema and softening found associated with abscess. We must remember, however, that a tumor may exert no more pressure than abscess, and that it may as effectively destroy brain-substance as the latter. Definite focal symptoms are less frequent from abscess than from a morbid growth, because the most common seats of the former are in those portions of the brain, the cerebellum, frontal and temporo-sphenoidal lobes, whose functions are not definitely known. It is probable that distinct localizing symptoms are as frequently absent as present from abscess of the brain.

*Frontal lobe.* A large abscess may exist unsuspected in the anterior portion of the frontal lobe, and a small one may be situated just anterior to the motor region without giving rise to symptoms indicative of its location. It is only when softening or œdema extends backward to the motor area of the cortex or the white substance beneath it, or pressure is exerted on this portion of the brain, that localizing symptoms develop, except in a few cases in which pupillary symptoms are found when the abscess is in the posterior and lower portion of the frontal lobe. If, with general symptoms of abscess of the brain following a blow on the front of the head, a septic embolus from the lungs or associated with an infective process in the frontal sinus, a gradual increasing paresis or paralysis of the face or arm on one side should occur, preceded, or not, by convulsive movements of the affected muscles, pupillary symptoms would indicate one frontal lobe as the seat of the abscess. If the pupil on the side opposite to the one on which the muscles are involved should become sluggish or inactive, while its fellow responded normally to light and accommodation, it would aid in locating the abscess in the posterior portion of the frontal lobe. It must be borne in mind, however, that the same pupillary phenomena may be present when the anterior portion of the temporo-sphenoidal lobe is the seat of the abscess, as occurs from a similar lesion in the posterior portion of the frontal, but suppuration in the former situation usually results from middle-ear disease. Macewen's observations in relation to the pupillary phenomena may be quoted in full: "When the abscess is situated in the temporo-sphenoidal lobe or the frontal lobe, the pupil on the same side as the abscess may either become myotic or mydriatic, accompanied by a degree of stability. When the abscess is small and produces cerebral irritation the pupil on the affected side may be more or less contracted and sluggish. When the abscess is large and exercises considerable pressure the pupil on the affected side is prone to stabile mydriasis. An abscess which is small and produces a stabile myosis to begin with, may, as it augments in bulk, produce a stabile mydriasis in the same eye. Occasionally, the only difference detectable is sluggishness of one pupil to both light and accommodation, while its neighbor acts freely. In a case of cerebral abscess a sluggish pupil with either mydriasis or myosis on the same side as an infective injury to the skull, or a unilateral otitis media, affords further evidence of the abscess being on the corresponding side of the brain." (*Pyogenic Infective Diseases of the Brain and Spinal Cord*, p. 145.) In five cases of abscess of the frontal lobe observed by me the pupillary phenomena described by Macewen were present in only one, but this was the only one of the five in which the abscess was located in the posterior portion of this lobe.

*Temporo-sphenoidal lobe.* A small abscess, and even one of considerable size, may be situated in the temporo-sphenoidal lobe without giving rise to any distinct localizing symptoms. In the case of chronic abscess of this lobe the history, most likely otitis media on the same side as the abscess, might afford the only clue to localization. A large abscess, on the other hand, would probably develop localizing symptoms from the effects of pressure on the surrounding structures, and if extensive softening and œdema should occur, regions of the brain whose functions are fairly well known would become involved. If the abscess were on the left side in the posterior portion of the temporal region, so as to affect the first and second temporo-sphenoidal convolutions, sensory aphasia would be present. On either side of the brain a large abscess in the anterior portion of this lobe might cause paresis or paralysis, first in the face, and secondly in the arm of the opposite side, with pupillary symptoms, such as sometimes occur in abscess situated in the posterior portion of the frontal lobe. Macewen has observed in cases of abscess in the anterior portion of the temporo-sphenoidal lobe paralysis of the third cranial nerve of the same side, thus producing crossed paralysis, the third cranial nerve on the same side as the abscess being affected and paralysis of the face and arm of the opposite side resulting. A careful study of the direction in which the paralysis extends after the first group of muscles is involved will often afford valuable information upon which to base a localizing diagnosis. Not infrequently the middle-ear disease which leads to acute abscess of the brain paralyzes the facial nerve as it passes through the Fallopian canal, but this rarely occurs in chronic abscess.

*Occipital lobe.* In three cases[1] of chronic abscess of the occipital lobe observed by me paresis and muscular rigidity, nearly complete hemianæsthesia, and hemianopsia of the opposite side existed. In each case the abscess was large and situated in the white substance, so as to exert pressure on the fibres of the posterior half of the internal capsule. It is probable that the fibres coming from the cortical centre of sight in the cuneus were rendered functionless, either by pressure or softening, as the cortical substance of this region did not seem to be directly involved. A small encapsulated abscess, in all probability, might remain in the white substance of the occipital lobe for a long time without giving rise to any localizing symptoms. It should be borne in mind that chronic abscess of the so called idiopathic variety (probably due to suppuration in distant portions of the body) is most commonly situated in the occipital lobe.

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[1] The Medical News, July 27, 1895.

*Cerebellum.* An encapsulated abscess of considerable size situated in the posterior portion of one lateral lobe of the cerebellum might cause no definite symptoms so long as it remained more or less latent. An abscess in the anterior portion of either lateral lobe or one in the middle lobe would likely give rise to pressure-symptoms on the pons and medulla, in which case cerebellar ataxia would be manifest. The cardiac and respiratory phenomena, together with yawning, observed in acute abscess of the cerebellum, would probably not occur in the chronic abscess until the terminal stage develops.

DIFFERENTIAL DIAGNOSIS. Other organic lesions than abscess of the brain are attended by symptoms common to intracranial suppuration, so that one of the most difficult problems encountered by the clinical physician in the diagnosis of chronic cerebral abscess is differentiating it from other diseases that so nearly resemble it, both in their clinical history and apparent etiology.

The following case illustrates the similarity of the symptoms of cerebral softening following thrombotic occlusion of an artery to those of cerebral abscess:

A man, aged twenty-two years, an Austrian by birth, a miner by occupation, living in Colorado four years, was admitted into the Arapahoe County Hospital, March 25, 1895, completely paralyzed in the left leg and arm and lower side of the face of the same side, the upper portion of the latter being paretic. His family history was negative, and he had always enjoyed good health up to the beginning of his present illness. He denied indulgence in alcohol further than an occasional glass of beer, and said that he had never exposed himself to venereal poison. About two months before coming under my care he suffered for two or three weeks from pain in the left side of the head and the left ear. Bleeding by the application of leeches over the left mastoid process seemed to relieve the pain, both in the head and ear. About four weeks ago he felt weak in the left arm for a day or two. The arm seemed all right on the third day, but on the fourth it became quite weak, and he began to suffer from pain in the left side of the head in the parietal region, and occasionally in the anterior temporal. Two days later the left leg was weak and awkward, and the day following the left side of the face was observed to be smooth and the mouth drawn to the right. Seventeen days ago, when he first came to Denver, from Idaho Springs, he could ascend and descend stairs, but the whole of the left side was weak, yet he could still use the left arm some, although not so well as the left leg. Two days later, or on the 10th of March, the left arm and leg and the lower portion of the left side of the face became completely paralyzed, and remained in this condition until he entered the hospital on the 25th day of March. Consciousness had never been affected.

*Examination on admission.* There was complete flaccid paralysis of the left arm, left leg at ankle and knee, and lower half of the left side of the face. The upper portion of the face and the hip were paretic. He could not close the left eye as tightly as he could the right. The tongue was protruded slightly to the left, and when the face was at rest the mouth was drawn a little to the right. The left side of the face seemed equally weak both for voluntary and emotional movements of the affected muscles. The deep reflexes were slightly increased on the left side, but the superficial were absent. It was impossible to make a satisfactory examination of the sensory phenomena in the absence of an interpreter. The fundi and disks of the eyes were normal. Both pupils were dilated, the left being larger than the right, and both acted feebly to light and accommodation. The axillary temperature was 98.6° F.; pulse 72; respiration 20. His mind seemed clear, and he appeared to appreciate what occurred around him. Three days later, or on the 28th, I began having the temperature registered in each axilla thrice daily, at 6 A.M., 12 M., and at 6 P.M.; and this was continued until April 12th, the time of the operation. At noon of the 28th the temperature was R. 99.8° F., L. 99.6°. It remained about the same until the next day at noon, when it was found one degree below normal, and the same in each axilla. On the 30th the temperature was found to be 100° F. in each axilla and the next two days it was normal. The pulse varied from 70 to 72, and respiration from 18 to 24.

On April 1, 1895, assisted by an interpreter, I made a more careful examination. At that time he could raise his left leg from the bed and hold it straight at the knee, but there was absolute paralysis of the muscles below the knee. The arm and face remained about the same as on the former examination. The left trunk-muscles were weaker than the right, but still retained considerable power. Dyn.: R., 120; L., 0. Knee-jerks: R., absent; L., increased. Ankle-clonus: R., absent; L., present and continuous. Tendo Achillis: R., absent; L., increased and attended by clonus. Plantar reflexes: R., present; L., absent. Cremaster and abdominal reflexes: R., present; L., absent. The deep reflexes of the right forearm were slightly increased; the left were exaggerated. All the sensory phenomena were lessened on the left side, the temperature-sense being the most impaired; on the right, sensation normal. Taste and smell present on each side and about equal. Hearing with watch: R., 10/12; L., 8/12; with tuning fork hearing better in left ear. Eyes: R., V. = 20/30(?); fields—temporal normal, nasal absent up to median line; and fundus and disk presented nothing abnormal. L., V. = 20/30(?); fields—nasal preserved, temporal absent up to median line. Some obscuring of the nasal side of the disk by congestion and recent exudate. Beginning neuro-retinitis was apparent. The next three or four days the axillary temperature was about normal or slightly subnormal. On one occasion it was nearly two degrees below normal. On April 4th the left fundus and disk remained about the same as on the 1st, and the right were still normal. Power seemed to be returning in the left leg, but no change could be detected in the arm and face. Bilateral left homonymous hemianopsia was still absolute. Sensory function was greatly lessened throughout the left side, but it was most impaired in the arm. During the entire time he had been in the hospital he had complained of considerable pain in the right side of the head, extending from the anterior temporal region back to the posterior parietal. Just how long he had had pain in the right side of the head I could not ascertain. It will be remembered that at the beginning of his illness the pain was in the left side of the head. The head-temperature had been persistently slightly elevated, and the rise was sufficient to lead me to diagnosticate an irritative lesion in the brain. From the 4th to the 12th of April the patient remained in nearly the same condition that he had been in from March 25th to April 4th, except that headache became more troublesome, and was limited to the right parietal region. The axillary temperature remained practically normal, was about equal in each axilla, but occasionally it was 0.1° to 0.2° higher in the left than in the right. As time wore on the tendency was for the temperature to be slightly continuously higher on the paralyzed side, but the difference was never more than a few tenths of a degree.

On April 10th he made a slight correction in the history of his illness. In the original history he had stated, or the interpreter had made him state, that he had pain in the left ear, and this, together with the head-pain, had been relieved by leeches applied over the mastoid region; but in his revision he said it was four months ago when he had pain in the left parietal and frontal regions of the head, and there was no pain in the ear. He reaffirmed the former statement that the pain in the left side of the head ceased on the application of leeches to the left mastoid region. About this time (or April 3d) it was observed that anæsthesia of the left side, including the face and scalp, was becoming more pronounced, and the special senses, taste and smell, were less acute than on the right side. Repeated registration of the surface-temperature of the head showed the head-temperature to be about two degrees above normal. This indicated an irritative lesion of the brain. The urine had been examined a number of times and found free from albumin and sugar, and no cardiac murmur had been detected. The young man's age was against the idea of hemorrhage; there was no cause, so far as I could detect, for embolism, and his repeated and positive assertion that he had never exposed himself so as to contract syphilis made me inclined to disregard the vascular lesions, although, in a clinical lecture on this case delivered the day before the patient was subjected to an operation, I stated that thrombotic occlusion of arteries of syphilitic origin would best explain the symptom-group. The localizing symptoms indicated two separate and distinct lesions, one in the Rolandic region on the right side, involving primarily the arm-centre, and the other in the centrum ovale of the temporo-occipital region of the same side. I argued that a single lesion in the centrum ovale so situated as to cause anæsthesia of the opposite side would affect the leg as much or more than the arm, and the face would be involved to a less extent than the leg or arm; but in this case, the face and arm being more affected than the leg, indicated that we should find two lesions. Excluding a vascular lesion, the probabilities were in favor of a tumor or an abscess. Multiple tumors in the centrum ovale are uncommon, and the absence of choked disks was decidedly against the diagnosis of tumor. In favor of abscess we had the gradual onset of the paralysis involving one group of muscles after another, and the seat of one of the lesions in the centrum ovale of the occipital lobe was the common location of abscess of pyæmic origin. No distinct cause could be found for abscess, but I consented to recommend an operation for the relief of the patient in hopes that we should be fortunate enough to find and evacuate one or more abscesses.

On the 12th of April Dr. Edmund J. A. Rogers removed a button of bone from the skull over the arm-centre on the right side and found the brain-substance, including the cortex immediately beneath the trephine-opening, soft and diffluent, looking very much like pus. On exploring the centrum ovale in the occipital region another area of softening was found. Dr. Leonard Freeman, pathologist to the hospital, examined the material as it was taken from the brain, and his report is as follows:

"The soft, white material removed from the brain by Dr. Rogers closely resembled pus to the naked eye, but under the microscope no pus-corpuscles could be seen. A few red corpuscles were detected, but they probably came from the blood that mixed with the material during the operation. The corpuscles of Gluge were quite numerous, and some small fat-globules were observed here and there. The mass of the substance was composed of disintegrated nerve-fibres, which were rather short, and could be distinctly seen and accurately studied as they floated in the current of the fluid across the field. There were no gliomatous or other tumor-cells, and no crystals of any kind. There was no reticulated structure."

The operation was carried no further than to remove the most diffluent of the broken-down brain-substance. The wound was carefully dressed and the patient regained consciousness, and said his head felt better. About twelve hours after the operation he began to exhibit evidences of failing, and the temperature rose to 100° F. After this he lost rapidly, and died fifty hours after the operation, the temperature reaching 106° F. just before death.

*Autopsy*, six hours after death, performed by Dr. Leonard Freeman: On removing the iodoform gauze from the wound softened brain-substance and yellowish-whitish particles resembling disintegrated brain-substance ran out. The middle meningeal vessels on either side arose from the ophthalmic vessels. Great œdema existed at the base of the brain, especially around the cerebellum, pons, and medulla. The arteries at the base of the brain presented no evidence of disease, except on the right side, where the middle cerebral was thickened and its calibre was occluded by a thrombus at the point where the nutrient vessels to the basal ganglia are given off. The cortex of the middle and lower Rolandic region and temporo-sphenoidal lobe was softened. The cortex of the left hemisphere was negative. On cutting into the right cerebral hemisphere a large area of softening, about three inches by two in size, occupied the cortex of the middle and lower Rolandic region and the white substance beneath. The occipital lobe was the seat of a large area of softening which occupied nearly the entire white substance of this lobe. The softening in the occipital lobe reached the cortex postero-laterally. The entire corpus striatum and thalamus were softened but not diffluent. The interior of the left hemisphere presented no pathological appearances. Cerebellum and ventricles negative. The microscope showed the change in the arterial walls to be syphilitic.

In the light of the autopsy the clinical history is clear, and had not syphilis been so strenuously denied, no other diagnosis than that of arterial occlusion would have been seriously considered. It is useless to speculate whether the man knew he had syphilis; whether he had contracted it without sexual intercourse and did not know it; or whether the condition of his cerebral bloodvessels was due to hereditary syphilis. The latter is very improbable.

(To be concluded.)

# THE DIFFERENTIAL DIAGNOSIS OF URÆMIA AND MENINGITIS, WITH REPORT OF OBSCURE CASES.

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Uræmia is usually readily differentiated from organic cerebral disease, yet confusion may occur in atypical cases. Leube's[1] chief rule in the diagnosis of uræmia is formulated as follows: In patients with nephritis uræmic intoxication is to be assumed as the cause for nervous symptoms only when other causes can be excluded This method of diagnosis by exclusion has served Leube well, and he considers the method important, since in the course of renal disease occasional organic nervous lesions, such as hemorrhage and meningitis, may simulate uræmia. The clinical diagnosis in such cases is often made only with a certain degree of probability.

Pre-eminent importance attaches to the presence of albumin and casts, and to the amount of urine. With typical nephritic findings in the urine the diagnosis of uræmia is usually easy. Exceptions exist in that nephritis may be unattended by albuminuria,[2] casts may be permanently absent (Ackermann), and uræmia may intervene when the amount of urine and urea is normal (Christison). I have had under observation for over a year a case of chronic parenchymatous nephritis in which every variety of cast—epithelial, granular, and hyaline—is constantly present, while albumin is absent for months consecutively. Liebermeister[38] instances a case in which immediately before a uræmic seizure both urine and urea were increased twofold. To offset this case, Biermer[39] reports an instance of anuria for 222 hours before uræmia appeared. Albumin alone is no proof of uræmia, as it may occur in nervous lesions; *e. g.*, meningitis, hemorrhage, epilepsy, tetanus, etc. According to Fleischer,[1] uræmia being due to cerebral anæmia, we must guard against confusion with cerebral anæmia of other origin, since lowered arterial pressure may induce both cerebral anæmia and albuminous urine. Such albuminuria is transitory and unaccompanied by casts.

When conspicuous cardio-vascular symptoms attend nephritis they become valuable diagnostic adjuvants, worthy of considerable, but not implicit, confidence. Case III. exemplifies this point (latent meningitis with albuminous urine and cardio-vascular alteration, v. i.). Cardiac hypertrophy predisposes to apoplexy, hemorrhages, and inflammations in various viscera, especially in the retina. Cortical irritation increases arterial tension.[5] Moderate arterial tension increases the cardiac force, while excessive tension decreases it. Redundant toxins paralyze the vasomotor system and the heart's strength flags by the absence of that difference in arterial tension imperative for the maintenance of the circulation, hence the multiplicity of cardiac conditions conceivable in uræmia.[6] The pulse is slow, 40 to 60, before a uræmic attack (Thomas, Rosenstein, and Wagner), and later, after a convulsion, it is usually rapid. Early in meningitis the pulse is slow; later it is frequent.

Most important are the ophthalmoscopic findings, for retinitis albuminurica is rarely absent in chronic nephritis, leading to uræmia (Leube), and in acute uræmia the abundant albumin, casts, and œdema are sufficiently suggestive. In meningitis the pupils are mostly narrow and in uræmia dilated, yet uræmic myosis is observed.

Leube does not hesitate to admit that in certain cases the diagnosis of meningitis is for him more difficult than of any other cerebral lesion, because the complexus of symptoms varies and certain signs of meningitis occur in other intracranial diseases. Uræmia and meningitis have many symptoms in common—delirium, headache, vertigo, coma, convulsions, irregular breathing, and vomiting. Confusion is especially probable when the convulsions are localized in a few muscles, in which partial contractures, focal paralyses, and temperature appear. In such combinations the most experienced diagnostician may err. Meningitis and uræmia may coexist, yet meningitis is the least frequent of all the forms of serositis to which the uræmic patient is exposed.[10] Broadly speaking, circumscript convulsions and paralyses speak strongly for anatomical changes in the central nervous system, especially when constant, although such alterations occur rarely in uræmia. In uræmia they are chiefly fugitive. Literally I know of no focal nor general symptom or sign observed in meningitis which has not been recorded, singly or combined, in uræmia.

A synopsis of anomalous cases observed by others, with several of my own, seems in place because of meagre mention of the subject in literature. Jolly and Guinon[35] admit possible errors between uræmia and meningitis. Desnos[36] reports a case in which the patient during sound sleep was suddenly seized with dyspnœa, coma, and vomiting, and the urine showed much albumin. On autopsy the kidneys were normal, but there was a hemorrhage the size of a nut in the pons Varolii, breaking into the fourth ventricle. Rosenstein remarks that diagnosis is nearly impossible when motor and sensory symptoms occur synchronously with nephritis, which are due, however, not to urinary retention, but to a palpable disease—*e. g.*, meningitis. He cites a case: Urine 1009, much albumin, red and white blood-cells, casts, fat-granules; headache; dilated heart; coma; temperature 39.4° C.; wide pupils; no paralysis; slight twitchings of arms; autopsy disclosed nephritis plus suppurative basal meningitis. Murchison has described cases of uræmia closely resembling meningitis, presenting rigid neck, convulsions, and coma; but Gowers remarks that the temperature is normal in uræmia, v. i. Rosenstein's experience includes a case of uræmia with œdema, but without urinary findings, presenting a typhoid appearance; the post-mortem disclosed nephritis

Stenhouse Kirkes[37] drew attention to the fact that not all cerebral symptoms in nephritis are functional, but that some are of organic origin—*e. g.*, apoplexy. Thus uncomplicated aphasia was found due to hemorrhage in Broca's convolution.[9]

In meningitis the breathing is frequently sighing, irregular, and of the Cheyne-Stokes type. In uræmia, asthmatic attacks, angina pectoris vasomotoria,[3] a laryngeal croup type, Cheyne-Stokes breathing, and cyanosis are recorded.

The subject of temperature in uræmia is a mooted point. Many maintain it is reduced (Kien, Roberts, Hirtz, Billroth, Thaon, Hutchinson, Bourneville, Budin, Hanot, Lecombe, Behier, Lionville). Netter observed the temperature fall as low as 30° C. Others note a rise (Tarnier, Torday, Hippolite, Chauffard, Tenneson, Chantemesse). Lépine[7] found that the temperature may rise without convulsions or inflammation, explicable by vasomotor irritation and decreased heat-elimination. Landois produced a rise of temperature by irritation of the cerebral cortex, caused by vaso-constriction. Unusually low temperature is found where vasomotor paralysis exists and effete products accumulate in the system. Strümpell[8] observed not uncommonly a temperature rising to 39° C., irregular in type, rarely reaching 41.5°, and often associated with chills, vertigo, sweating, headache, and tinnitus aurium. Rosenstein[9] expects low temperature only in subjects depleted by diarrhœa and vomiting. Bartels, Guyot, d'A. Robert, Dumont, and others confirm Rosenstein's position, although most authorities oppose his views.

The most concise general statement[9] regarding uræmic nervous phenomena asserts: 1. That *paralysis* affects especially the sensorium, to a less degree the special senses, and rarely motility; 2. That *irritation* seldom selects the sensorium (*e. g.*, delirium); it mostly engages the motor paths (convulsions), and never implicates the special senses.

Uræmic convulsions are tonic or clonic. Described usually as general, they may by unusual localization resemble focal symptoms. Thus Rosenstein,[9] Strümpell,[16] and Bartels[17] have found convulsions on half the body, one-half the tongue, and in the left arm and leg, with deviation of the head to the left. They have occurred with convergent strabismus, [40, 15] facial spasm like tic convulsive (Lasègue and G. Sée), delirium, etc. Convulsions have simulated epilepsy and Jacksonian epilepsy. Nystagmus,[44] localized tremblings, and twitchings are recorded.[41 42 43 31] Twitchings are easily overlooked before and after coma (Traube[45]). Grinding of the teeth, frequently observed in meningitis, also occurs in uræmia (Strümpell and Bourdillat[46]). Although tonic convulsions rarely complicate uræmia, yet a tetanic type is recognized. The cases of uræmia of Thomas, Weiss, d'Aran, de Hausser, Rauth, and Jaccoud exhibited trismus. Avrard relates a case in which convulsions on one side and contractures on the other were combined. Jaccoud[11] places on record three cases of spasmodic contractures of the forearm and cervico-dorsal flexors, producing opisthotonos. Convulsions and contractures have coincided upon one side of the body, and a case of flaccid hemiplegia was transformed by uræmia into hemiplegia with convulsions and contractures (Raymond).

Rigidity of the neck, rarely absent in meningitis, cannot be excluded from the symptomatology of uræmia (cases of Jaccoud,[11] Kussmaul,[12] Rose,[13] Weiss,[14] Cohen,[15] and Thomas). The hands, usually free in tetanus, are involved in uræmia. Retraction of the head is also caused by rheumatism,[47] diseases in the medulla, aneurism of basilar artery, brain-tumors in the posterior fossa, peripheral irritation, tender cervical glands, and abdominal disturbances.[4]

Paralyses in uræmia are infrequent, so that Lesègue, Lecorché, and Talamon deny their existence. They are chiefly transitory hemiplegias. The cases assigned are cerebral œdema, capillary hemorrhage, softening, apoplexy, inflammatory foci, or cortical overstimulation by toxins. Some instances of hemiplegia are the following: Cases of Fuchs,[19] Baginsky,[20] Addy (with aphasia, amnesia, and deafness[21]), Paetsch,[22] Churchille,[23] Imbert-Gourbeyre,[24] Rego (aphasia[25]), Lequima,[28], Raymond,[29] Charpentier,[30] Thomas,[5] Blackhall, Leichtenstern, Simpson, Townsend, Rosenstein, Chauffard, and Mutenesse. Paraplegia seems to have occurred but twice.[26 29] Jaeckel in four hemiplegias found facial paralysis twice and one crossed oculomotor paralysis, with no post-mortem lesion except œdema cerebri. Other combinations are: aphasia with facial paralysis (Dieulafoy[32]), glossoplegia,[33 34] neuralgia, myosis, spasticity of arm, right facial paralysis and right hemiplegia.[31] Dunin's[5] cases exhibited the following focal symptoms: Case 1, unilateral spasms; 2, unilateral spasm with aphasia; 3, aphasia, both internal recti paralyzed, diplopia, nystagmus.

The following histories illustrate the difficulties met in equivocal cases:

Case I.—Woman, aged forty years; delirious; pulse 90 to 120; fairly continuous temperature, ranging between 101.9° and 102.6°; tongue dry and coated brown; glazed pharynx; respirations 30; diffuse bilateral moist mucous râles, with signs of hypostasis over the lower lobes behind and at base; pulse not tense; second aortic tone slightly accentuated; arteries somewhat tortuous and rigid. The urine is ammoniacal, 1015, albuminous, but contains considerable pus and micrococci, yet no casts warranting a diagnosis of cystitis; the amount cannot be obtained on account of involuntary evacuations. There is divergent strabismus due to paralysis of the left internal rectus; there is ptosis on the left side and right hemiplegia, complete save for the upper facial twig. The paralyses were present five days ante mortem. Clinical diagnosis—meningitis and cystitis. Autopsy—œdema of the brain; no meningitis; no cerebral lesion; arterio-sclerosis; diffuse bronchitis with hypostasis; diffuse pyelonephritis secondary to cystitis; hence uræmia.

Case II.—Married woman, thirty-three years old; denies syphilis and abortions; mind wanders, and her accounts of the previous history and present illness are unreliable. No œdema; no leucoderma; no eruption; slight alopecia; pharynx and mouth negative; pulse, temperature, and respiration normal; reflexes somewhat exaggerated; sensation normal except some slight general hyperæsthesia, especially over tibiæ. The left abducens and left oculomotor nerves and the lower half of the right facial nerve are paralyzed; power in the extremities is apparently normal, but the mental condition makes voluntary muscular tests difficult. The urine shows hyaline and granular casts and abundant albumin, still an additional lesion in the cranium is suspected from the multiple nerve-affections, and a process at basem cranii, probably syphilis, is diagnosticated. Antisyphilitic treatment futile; sudden death. Autopsy—chronic parenchymatous nephritis, with the usual macroscopic and microscopic findings; left heart dilated, but not hypertrophied; *brain absolutely negative;* hence no cerebral lesion, but uræmia.

Case III.—Man, aged forty years; admitted to Cook County Hospital in delirium, without any history; marked arterio-sclerosis; tortuous brachials; atheromatous plaques on radials; pulse 90, tense, regular, quick; no temperature; left heart distinctly dilated; apex in left vertical nipple-line strong and heaving; the second aortic tone loud and metallic; urine heavily loaded with albumin, but no casts nor formed elements found. The diagnosis lies between uræmia and meningitis. No rigidity of neck, no ear disease, no temperature, no focal symptoms; retina negative. Because of the cardio-vascular changes and albuminuria I diagnosticated uræmia. Autopsy—marked universal arterio sclerosis; atheroma aortæ; hypertrophy and dilatation of the left ventricle and to a less degree of the right; *kidneys* and other viscera wholly negative; a diffuse purulent meningitis over base and convexity originating from an empyema of the sphenoid sinuses. (V. s., regarding value of cardio-vascular signs in the diagnosis of uræmia.)

Case IV.—A case closely resembling delirium tremens, with history of recent and ancient alcoholic excesses. Urine 1018, acid, much albumin, 1500 to 1800 cm. per diem; moderate number of hyaline, granular, and epithelial casts; history of previous anasarca and ascites; left ventricle hypertrophied and dilated; pulse very tense with appropriate sphygmographic tracings; headache, delirium, sopor, and vomiting; no convulsions, but two sudden lapses into coma, with temporary recovery; neuro-retinitis hemorrhagica; suddenly a paralysis of the right and a paresis of the left rectus internus, lasting four days, causing diplopia, disappearing for three days, recurring with right ptosis. Death. Clinical diagnosis—secondary contracted kidney, cardiac hypertrophy, and dilatation; œdema of brain. Autopsy confirmed clinical diagnosis; the cerebral œdema being very pronounced. There were no gross brain-lesions.

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# REVIEWS.

An Introduction to Pathology and Morbid Anatomy. By T. Henry Green, M.D., F.R.C.P., Physician and Special Lecturer on Clinical Medicine at Charing Cross Hospital, and Physician to the Hospital for Consumption and Diseases of the Chest, Brompton. Seventh American, from the eighth English edition. Revised and enlarged by H. Montague Murray, M.D., F.R.C.P., Physician to Out-patients and Lecturer on Pathology and Morbid Anatomy at Charing Cross Hospital. Illustrated by two hundred and twenty-four engravings. 8vo., pp. 598. Philadelphia and New York: Lea Brothers & Co., 1895.

There is little to be said by the reviewer on the occasion of the reissue of a book so widely known and of such tried excellence as the one before us. His function is for the most part to bring the fact of its reappearance to the notice of those who may be interested and to pass upon the quality of its editing.

In the present, the seventh American from the eighth English edition, we see the same familiar dress as heretofore, the same excellent typography, and on every page there is evidence of the thorough and painstaking revision which the text has undergone at the hands of Dr. Murray in the effort to bring it in line with the most recent advances in our knowledge. As the result, the book, though in some particulars retaining a somewhat disjointed presentation of the subject, may be fairly said to contain one of the clearest and best statements in the English language of our present knowledge of pathology.

The presentation of the subject is spoken of as in a measure disjointed because there is noticeable throughout the book what we believe to be an unfortunate lack of generalization. The relations of various processes closely allied to one another are not brought out as we would wish and as the present status of our knowledge of disease in its various phases would warrant.

We conceive that at the present day a work upon pathology to be thoroughly scientific should seek to present the subject in such a light that the sequence of cause and effect should be most clear. It is apt to be forgotten that the changes incident to disease are natural phenomena, and that a mechanical, or, perhaps better, a physical, basis underlies them all just as it does all other natural phenomena. While it would be absurd to hold that we are in possession of all the influences conducing to every process of disease, we are, nevertheless, able to comprehend a number in each case, and their careful study in relation to the condition which they induce throws much light on the nature of the process in question and serves to bring it in touch with the other natural phenomena of disease.

An illustration may serve to make our meaning more clear. In the book before us the chapter on Inflammation contains a most excellent and straightforward statement of the various changes incident to that process in general and to the different so-called varieties of inflammation. In all the structural peculiarities are well stated, but we search in vain for any explanation of them. We are left unaided in our efforts to understand why in suppurative inflammation, for instance, emigration should have such an important part, and why in tubercular inflammation we should have so considerable a development of connective tissue, cheesy degeneration, etc.

Now, we hold, and have already suggested in this JOURNAL in connection with another matter, that the recent advance in our knowledge of the exciting cause of these and the other specific varieties of inflammation in which the etiological factor is known, enables us to formulate a most satisfactory correlation of cause and effect between the qualities of the specific bacteria in each case and the peculiarities of the lesion which they excite. Thus, in the case of suppurative inflammation study of the cause has shown it to include several distinct species of bacteria, often very different in many of their characteristics, but all invariably possessed of one character in common, the production in their growth of a substance possessed of marked positive chemotactic quality. Here we have at once a physical reason for the preponderant feature of suppurative inflammation. It may be that in the case of some of the germs producing suppuration the precise manner in which this positive chemotactic influence is exercised is as yet unknown, but in the most important of these germs such action has been clearly demonstrated and affords the ground for our present understanding of the suppurative process.

In the case of tuberculosis the evidence is, if possible, even more definite. The dead bodies of the tubercle bacilli have been shown to possess the power of stimulating connective-tissue growth, while the broth in which the bacilli have grown and from which they have been removed by filtration (tuberculin) has been demonstrated to possess the power of inducing exudation and cheesy degeneration. Connective-tissue growth, exudation, and cheesy degeneration, all the elements of the tubercular process, are thus found to have their *raison d'être* in qualities inherent in the germ which causes the disease, and we may further submit in explanation of the chronicity of the process the sluggish growth which characterizes the tubercle bacillus.

As before remarked, to contend that we are in possession of all the factors conducing to the production of all pathological processes, or, indeed, of any one of them, would be manifestly absurd; but we have definite knowledge of a number of such factors which has stood the most critical tests and which may safely be made use of in the elucidation of the processes with which they are associated, and we maintain that they should be so made use of to the utmost.

It is in just this working out of the relation of cause and effect that our text-books of pathology are lacking to-day, and without the indication of such relationship pathology consists of little more than a confused jumble of abstract facts, difficult to remember, and devoid of any scientific or rational inter-relationship.

Another point in which the present volume is disappointing is in its illustration. Though the illustrations are reasonably numerous, they are for the most part of very poor quality and poorly reproduce the conditions they are intended to depict. This appears to be in the main the result of two shortcomings: They are too small to exhibit clearly the topographical relations of the lesions, and many of them are lacking in detail in cases where the intimate relation of cells and stroma should be clearly demonstrated. As instances of the former of these faults, we may cite the majority of the illustrations of lesions of the lung, kidney, liver, and lymph-nodes. Figure 75 is a striking example of both. It is supposed to represent in two cuts the structure of a scirrhus of the mamma. The cut marked *a* has about the area of a 25-cent piece, the other, marked *b*, is easily covered by a 5-cent piece; both are nearly as nondescript as far as showing any structural relations as could well be conceived. Such illustrations are worse than useless, as they occupy valuable space. We note with regret that a number of the worst of them have come down through editions as far back as 1884, and are probably of even greater antiquity. Is it possible that the editors of the various editions have been oblivious of the utter worthlessness of these plates?

A few typographical errors in a book of this size are, of course, unavoidable. We call attention to two as they render the meaning obscure and are liable to lead to misconception. These are "*now*" for *not* on page 38, bottom line; and "*oxidation*" for *exudation* on page 291, line 16.

J. S. E.

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HISTOPATHOLOGY OF THE DISEASES OF THE SKIN. By DR. P. G. UNNA. Translated from the German, with the assistance of the author, by NORMAN WALKER, M.D., F.R.C.P. Ed., with double colored plate containing nineteen illustrations and forty-two additional illustrations in the text. 8vo., pp. 1205. Edinburgh and New York, 1896.

THIS work in German was recently reviewed in this JOURNAL (February, 1895). Its appearance now in English must be gratifying to all readers of the English language. On the former occasion we expressed high appreciation of the value of the book, and perusal again in a more familiar language fully corroborates that opinion. The author has long been favorably known throughout the civilized world in connection with diseases of the skin, and especially as an earnest, indefatigable worker in pathology and pathological anatomy. As he states in the preface to the book before us, the study of pathology in connection with the skin has two very great advantages. First, we can always get fresh, living material for investigation; and, secondly, it is possible to observe the part, and to note its relation to the disease as a whole, before excision. By comparing clinical symptoms with the histological details, the macro- and microscopic appearances may be brought into harmony with each other. Under these circumstances it is easy to see that a thorough study of cutaneous pathology must have an important bearing upon general pathology. As Unna states, the aim of all of our pathology should be enlightenment of clinical study, and this observation forms the basis of the work under review. The older methods of examination of tissue are nearly all nuclear stains, many of which, especially the mitotic stains of Flemming, have been of great value in many pathological processes; but the most important changes occur in the protoplasm of the cells, where alone, in the author's opinion, can the history of many diseases be studied. The nuclei are the reproductive organs of the tissues, and they are to be studied through specific staining-methods for the protoplasm.

The subject-matter of the book is considered under (1) Anomalies of Circulation; (2) Inflammations; (3) Progressive Disturbances of Nutrition; (4) Regressive Disturbances of Nutrition; (5) Malformations; (6) Saprophytes and Foreign Bodies.

The section on Inflammations comprises a vast array of diseases grouped into it: *a.* Traumatic; *b.* Neurotic; and *c.* Infectious; the latter including eczema, psoriasis, lichen, ichthyosis, acne, and other diseases of the sebaceous and sweat glands, and many other diseases too numerous to mention. In fact, by far the majority of all the diseases of the skin are to be found in this group.

To analyze the contents of a work so great, exhaustive, and voluminous as this is, of course, not to be attempted, but we may direct attention to one or two points in connection with the commonest disease of the skin, namely, eczema. This is considered under two distinct headings: (I.) Acute Vesicular, and (II.) Chronic. The former the author defines as the "primitive acute outbreak of eczema in the form of vesicles, which, as such, rapidly heals or passes into the ordinary common eczema—that is, a chronic skin disease." This is a very different conception from Hebra's acute eczema, accompanied by erysipelatous swelling and œdema. Chronic eczema proper is regarded as a moist catarrh of the skin, which is a uniform histological process; but the unity does not consist in a constant series of stages (papular, vesicular, rubrum, etc.). A uniform complex of three histological symptoms is really the basis of every eczema; these are: (I.) the scale-formation (parakeratosis); (II.) the papule-formation, or the epithelial growth (acanthosis); and (III.) the vesicle-formation, or the spongy transformation of the epithelium.

It is notable with eczema as with other diseases that the histo-pathology is approached from a novel standpoint, familiar, however, to those readers who have followed the distinguished and brilliant author throughout the dermatological literature of the past fifteen or twenty years. Upon every page we note evidences of minute and careful study with the modern methods of research, with the result that with each disease a new page of information is unfolded. There exists an extensive chapter devoted to the histo-pathology of the syphilitic cutaneous manifestations, which is much the best work that has ever been published on the subject. Preceding almost all the diseases considered there is a short statement of the clinical features, which serves as a guide to the main work, so that one is never left in doubt as to the precise clinical picture which is being discussed from the histo-pathological standpoint.

We earnestly commend the book to all interested in general pathology as well as to dermatologists, and while we cannot agree with some of the ultra views put forth by the distinguished author, we have no hesitation in stating that a great wealth of valuable information is contained in the volume. It is the most remarkable and valuable work that has ever been written on the subject, and contains an almost inexhaustive fund of knowledge upon which pathologists will draw for many years to come.

The translation, in itself a great undertaking, has been done by the skilful hand of Dr. Norman Walker, of Edinburgh, formerly a favored pupil of Dr. Unna in Hamburg, and leaves absolutely nothing to be desired. The reading is intelligible, plain, and free from German idioms.

We question whether another translator so particularly well trained and equipped for this task could have been found.

The illustrations are new and are chosen to represent some of the many novel features discussed, but the reader must not expect to find an atlas. The text is infinitely more important than the drawings, which, we may observe, are not numerous, considering the magnitude of the book.

The publisher (Mr. William F. Clay, of Edinburgh) has given a very elegant volume from the standpoint of paper and type. An index of diseases with many references completes the book. We again cordially commend the book to all who are interested in scientific medicine.

L. A. .D.

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Epidemic Ophthalmia: Its Symptoms, Diagnosis, and Management. With Papers upon Allied Subjects. By Sidney Stephenson, M.B., F.R C.S. Ed. Edinburgh and London: Young J. Pentland. New York: McMillan & Co., 1896.

Dr. Stephenson is a recognized authority on all subjects pertaining to contagious inflammatory affections of the conjunctiva, and he is much to be congratulated upon having gathered together the literature of this subject, which is carefully analyzed and sifted, and still more to be congratulated upon having added to it the results of his own ripe experience.

Under the title "Epidemic Ophthalmia," which might be more suitably replaced with the words "epidemic conjunctivitis," the following diseases are included: Muco-purulent or catarrhal ophthalmia, purulent ophthalmia, diphtheritic ophthalmia, and acute trachoma. Of muco-purulent conjunctivitis two varieties are described, the ordinary infectious conjunctivitis which is common in the spring and autumn, and that conjunctival inflammation which the older writers were accustomed to call "pustular," or "aphthous ophthalmia." Dr. Stephenson regards the latter as an affection distinct from a true phlyctenular conjunctivitis.

Purulent ophthalmia, which includes ophthalmia neonatorum and gonorrhœal ophthalmia, is considered always to be due to a contagion, and true diphtheritic ophthalmia to the presence of the Klebs-Loeffler bacillus. While acute trachoma is believed to arise through the agency of a specific contagion, the exact nature of the micro-organism, or possibly the parasitic protozoa, has not been determined. In this connection the following significant sentence occurs: "However trachoma begins, it is, in my judgment, a malady that originates in contagion and in that alone. I no more believe in its spontaneous evolution than I do in the *de novo* origin of measles or of ringworm."

A brief summary of this author's views of the origin of these conjunctival inflammations is contained in the following quotation: "Of the four acute affections, then, grouped together under the common name epidemic ophthalmia, three arise from contagion, viz., purulent and diphtheritic conjunctivitis and acute trachoma. With regard to the fourth, catarrhal ophthalmia, whatever be its origin, it spreads, at any rate, by transfer of discharge. A proper knowledge of these facts underlies all successful preventive treatment and furnishes us with a clue to many precautions that might otherwise seem unnecessarily tedious and minute." The bacillus of Weeks is described, and its presence considered to indicate that the case is one of catarrhal ophthalmia. We are of the opinion that the author might have gone further and declared this micro-organism to be the specific cause of epidemic conjunctivitis.

Stephenson agrees with Raehlmann that these contagious types of conjunctivitis are incapable of atmospheric dissemination, and therefore all preventive measures should be based on a theory that contagious eye maladies are spread by the direct or indirect conveyance of specific discharges from eye to eye. The most likely agents in passing on infectious particles are washing utensils, hands and fingers, handkerchiefs, bed-linen, body-apparel, animals, and miscellaneous agents.

This portion of the book concludes with a full consideration of the management of outbreaks of epidemic conjunctivitis in schools, asylums, and similar institutions, the education of those suffering with ophthalmia, and contains full directions for securing proper medical inspection and hygienic arrangements.

The next chapter comprises, according to its title, a clinical inquiry into the prevalence and significance of the follicular granulation of the conjunctiva, and discusses fully the vexed question of the relation of follicular conjunctivitis and folliculosis to trachoma. Dr. Stephenson concludes that the follicular granulation does not constitute the initial stage of the specific disease trachoma ; that it is not necessarily an immediate and direct outcome of an unhealthy environment ; that there is no decisive evidence that it predisposes to trachoma ; that in all likelihood it is an expression of what he terms the "adenoid activity" of young subjects, being comparable to the follicular projection of the pharynx.

The chapter on the Treatment of Trachoma and its Complications opens with a very interesting introductory sketch of the history of this disease and the methods which have been practised for its cure. This is followed by the various plans of treatment which have been of particular service to Dr. Stephenson. His most important conclusions are as follows : Bluestone and lunar caustic are the most trustworthy escharotics ; expression is an operation of great value and deserves a permanent place in the treatment of trachoma ; excision of the upper cul-de-sac is worthy of trial in cases of trachoma that resist ordinary methods of treatment ; a combination of surgical and escharotic methods not infrequently forms the speediest, safest, and the most rational means of attacking the disease. The last quotation deserves emphasis, because one reason of the lack of success in many operations for trachoma consists in the failure to carry on the medicinal treatment of the case after the completion of the operation.

The complications of trachoma receive full consideration, both in description and treatment, and a special chapter is devoted to the treatment of follicular conjunctivitis. Dr. Stephenson prefers ointments containing lead, and his usual plan is to commence the treatment with a 1 per cent. ointment of the subacetate, which is gradually increased in strength to 5 per cent. Expression is also employed, but only when the growths are of comparatively large size. If much discharge is present, he uses a tepid solution of corrosive sublimate, 1 to 5000.

The book concludes with an Appendix, well illustrated, describing the proper lavatory arrangements in schools, barracks, and asylums, and also the proper management of the accessories—towels, sponges, and the like.

We commend this excellent book not only to every physician whose practice is likely to bring him in contact with the diseases which are described, but also to superintendents, officers, and managers of almshouses, asylums, children's homes, and similar institutions, in which it is essential to endeavor to prevent the entrance of epidemic conjunctivitis, and in which, if the disease has already found a footing, all measures to stamp it out of existence should be employed. G. E. de S.

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Geschichte der Volksseuchen wach und mit den Berichten der Zeitgenossen, mit Beräcksichtigung der Thierseuchen. Von Dr. B. M. Lersch. Pp. 445. Berlin: S. Karger, 1896.

This is an extremely valuable reference-book, the preparation of which must have involved an enormous amount of reading and research. It presents a history of epidemic diseases from the earliest to the present time, giving the dates and main facts of outbreaks of these diseases wherever occurring. Many of the most important and widespread epidemics are described in great detail, with full accounts of symptoms, treatment, meteorological conditions, and other matters of interest. The insertion of full references to authorities would have added greatly to the value of the book for other workers in the field of epidemiology. In a very great number of instances, for example, no authority whatever is given and this omission is inexcusable. C. H.

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Deaf-mutism. A Clinical and Pathological Study. By James Kerr Love, M.D, Aural Surgeon to the Glasgow Royal Infirmary; Honorary Aurist to the Glasgow Deaf and Dumb Institution. With Chapters on the Education and Training of Deaf Mutes, by W. H. Addison, A.C P., Principal of the Glasgow Deaf and Dumb Institution. Pp. 369. Glasgow: James MacLehose & Sons, Publishers to the University, 1896. New York: Macmillan & Co.

Chapters I. to VIII. are the work of Dr. Love, and are the only ones that appeal to the medical man. The work as a whole is emphatically one to be studied by teachers of the deaf and dumb. The name of the book should be Deaf-dumbness, and not "Deaf-mutism." The latter is a translation of the French "Surdimutité," and we could never understand why English writers preferred it to honest English "deaf-dumbness." The Germans command our respect with their word "Taubstummheit." Why do not our English writers show similar regard for their own language and use pure English when they can?

The chapter on Diagnosis, Prognosis, and Treatment of "Deaf-mutism," or the "surdism"—*i. e.*, the deafness of the mute—is very inferior to what it might have been had the author shown any knowledge of what might be done to relieve the deafness of the mute. The latter can certainly be done in the acquired cases, especially in many instances of purulency. Not one suggestion is made that such aid may be given to a mute, just as it is in many cases of deafness in those not mutes, by intratympanic operations. And it must be remembered that any improvement in hearing enables the deaf-mute to acquire more easily lip-reading and articulation. The author of this chapter either knows nothing about such operations or suppresses what he knows. He contents himself with treatment of the nasopharynx. His indifference to any rational treatment of the ear in the deaf-mute may be due to his view (p. 181) that the deafness in the mute "is generally due to damage to the internal ear, the auditory nerve, or its connections in the brain"—a statement, however, which cannot be substantiated, at least in the acquired cases with purulency.

The book is well written and handsomely printed and bound.

C. H. B.

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LES SUPPURATIONS DE L'APOPHYSE MASTOÏDE, ET LEUR TRAITEMENT. Par A. BROCA and F. LUBET-BARBON. Pp. 259. Paris: G. Steinheil, 1895.

THIS work, which shows care and industry in observation and recording cases of mastoid disease, is divided into an introduction and four chapters. The latter are denominated Mastoid Abscesses, Mastoid Fistulæ, Chronic Suppurative Otitides, with Latent Mastoiditis, and a chapter on Results.

The first chapter is subdivided into (1) Sketch of the Pathological Anatomy and Physiology, (2) Symptoms, (3) Diagnosis, (4) Therapeutic Indications, and (5) Treatment of Acute Mastoiditis.

The second chapter is subdivided into (1) Physical Signs and Osseous Lesions, (2) Therapeutic Indications and Surgical Operations, and (3) Intracranial Complications.

The third chapter is not subdivided, but the fourth chapter is divided into (1) Cases, (2) General Statistics, and (3) Results According to the Nature of the Lesion.

The authors make the term mastoiditis, or mastoid abscess, very comprehensive, placing under it many comparatively trifling affections of the soft parts of the mastoid and intramastoid processes which have terminated safely and spontaneously beneath the soft tissues of the mastoid cortex. It also seems from a scrutiny of the notes of cases that in many instances the so-called mastoid abscess or fistula was the result of an irritant and secondarily infectious treatment of the inflamed ear. Viewed in the light of the recent papers upon antiseptic treatment of ear disease by Gradenigo and Pes, in Italy, and Lermoyez and Helme,[1] in France, this work under review belongs to the period of what may be termed "septic aural surgery."

C. H. B.

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SPECTACLES AND EYEGLASSES: THEIR FORMS, MOUNTING, AND PROPER ADJUSTMENT. By R. J. PHILLIPS, M.D., Ophthalmic Surgeon to the Presbyterian Hospital in Philadelphia, etc. Second edition, revised, with forty-nine illustrations. Philadelphia: P. Blakiston, Son & Co., 1895.

THIS excellent manual, which has reached its second edition, continues to be the best book on the subject of which it treats. It should be read by everyone who is interested in that most important portion of the ophthalmic surgeon's work—the supervision of the proper adjustment of spectacles. It is doubly useful for those practitioners of ophthalmology who are unable to command the services of a skilled optician.

G. DE S.

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[1] See this JOURNAL, July, 1895, pp. 104, 105.

A PICTORIAL ATLAS OF SKIN DISEASES AND SYPHILITIC AFFECTIONS. In Photo-lithochromes from Models in the Museum of the Saint Louis Hospital, Paris. With explanatory woodcuts and text. By ERNEST BESNIER, A. FOURNIER, TENNESON, HALLOPEAU, DU CASTEL, HENRI FEULARD, and LEON JACQUET. English edition, edited and annotated by J. J. PRINGLE, M.B., F.R.C.P. Part II. London: The Rebman Publishing Co. Philadelphia: W. B. Saunders, 1896.

THE first plate in Part II. of this most promising *Atlas* is one of lupus erythematosus, portraying the disease on the nose, cheeks, and ear. This case and accompanying notes are presented by Hallopeau. The representation of this disease is most life-like. A woodcut of the same is also given with explanatory references to the parts, showing the different stages of the process. As supporting its asserted tuberculous nature, it is stated that the patient had lost one brother and one sister from tuberculous disease, and that the patient himself had in childhood suppuration of a cervical gland. The next plate shows hypertrophic rosacea of the nose and lower and middle forehead, in which regions the skin forms veritable convoluted masses, resembling the frontal leontiasis of leprosy. The case and notes are presented by Besnier. This illustration is presented as that of a rare case, and will be of much interest to dermatologists. The third plate exhibits a circinate papulo-squamous syphiloderm, the eruption being in great profusion. The plate shows the face. Woodcuts of two other cases are also given—one showing papulo-squamous patches on the back of the hand and wrist, and the other exhibiting enormous syphilitic patches of a papulo-crusty form on the anterior trunk. The fourth, and last, plate of this part is one showing xanthoma planum et tuberosum. The plate presents one-half of the upper face and forehead and the palm of the hand of the same patient. In the former xanthoma of the eyelid and adjacent region is most satisfactorily depicted. That on the palm is also well shown, but this is a rare site for the disease and is not so valuable, therefore, from the everyday physician's standpoint. The case and notes are given by M. Darier. The patient was "glycosuric, icteric, and obese." This completes Part II. It further emphasizes the fact that this publication is a most admirable and artistic one; the coloring is true to nature, and the histories given and the clear explanatory text add materially to its value.

H. W. S.

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THE FUNCTIONAL EXAMINATION OF THE EYE. By JOHN HERBERT CLAIBORNE, JR., M.D., Adjunct Professor of Ophthalmology in the New York Polyclinic. With twenty-one illustrations. Philadelphia: The Edwards & Docker Co., 1895.

DR. CLAIBORNE'S little book, according to a statement in the introduction, is the result of a course of lectures delivered to the students of the New York Polyclinic. It is elementary, and written in an easy, colloquial style, which the author informs us he has adopted because he believes he can by it make his meaning more clear. The book describes the faculty of vision, the method of conducting an examination, a few of the properties of lenses and prisms, and then devotes itself to the correction of astigmatism and presbyopia. The chapter on Presbyopia is the best one in the book. If the correction of errors of refraction, particularly of astigmatism, was really as non-laborious an occupation as Dr. Claiborne's sentences make it appear, what a saving of time there would be in the practical ophthalmic surgeon's office!

A good many surgeons will not agree with Dr. Claiborne's view of the mydriatics. Personally we are inclined to believe with him that homatropine and atropine sulphate are sufficient for all practical purposes. We do not believe, however, that it is an advantage to add cocaine to the homatropine solution. Neither do we believe that there is any difficulty in prescribing a glass during the effect of a mydriatic, provided a proper examination of the functions of the eye and the balance of the external ocular muscles has been made before the mydriatic was instilled. These examinations are omitted in Dr. Claiborne's book. We regret that the author should not have made his manual somewhat larger, and included it the examinations of muscles, the field of vision, the field of fixation, and the estimation of the color-sense and the light-sense. The title of the book entitles the reader to expect a description of these topics.

G. DE S.

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A MANUAL OF OPERATIVE SURGERY. By LEWIS A. STIMSON, B.A., M.D., Surgeon to the New York, Bellevue, and Hudson Street Hospitals; Professor of Surgery in the University of the City of New York, etc., and JOHN ROGERS, Jr., B.A., M.D., Assistant Demonstrator of Anatomy in the College of Physicians and Surgeons, New York; Surgeon of the Out-patient Staff, Hudson Street Hospital. Third edition. New York and Philadelphia: Lea Brothers & Co., 1895.

THE whole of this work has been thoroughly revised by the junior author. A large number of well-executed cuts and about one hundred pages of text have been added. The descriptions of many operations formerly in vogue have been omitted, and a more lengthy and detailed description given to the ones substituted. The author has confined himself to the practical aspect of treatment by operation. The indications are not dealt with, neither is included the preparation of the patient or the after treatment of the case.

The section devoted to the cranium and abdomen has been entirely rewritten and brought up to the requirements due to the advances in this important branch of work. The chapter dealing with plastic operations is well illustrated, clear, concise, and thoroughly practical, dealing with all that is really essential and important.

On the whole, we can commend the book as a useful and practical guide to the most important surgical operations. It is by no means an exhaustive treatise, yet it is eminently readable, and should be appreciated by all students and practitioners who wish to obtain a clear and comprehensive insight into any operative procedure. The publishers' share in the production of the volume is deserving of all praise. The paper is good and the printing neat and more than ordinarily accurate.

R. H. H.

# PROGRESS
# OF
# MEDICAL SCIENCE.

## THERAPEUTICS.

UNDER THE CHARGE OF
REYNOLD W. WILCOX, M.D., LL.D.,
PROFESSOR OF MEDICINE AND THERAPEUTICS AT THE NEW YORK POST-GRADUATE MEDICAL SCHOOL AND HOSPITAL; VISITING PHYSICIAN TO ST. MARK'S HOSPITAL.

### The Treatment of Pulmonary Tuberculosis by Injections of Guaiacol and Iodoform in Sterilized Olive Oil.

Dr. Breton has made use of this method for fourteen months, observing thirteen patients who received in all one hundred and fifty injections. Of these patients five, in the last stages of the disease, have died. The formula is: Guaiacol, 5; iodoform, 1; sterilized olive oil, 100. The injections are made into the abdomen or flank, with all antiseptic precautions. The amount is gradually increased from fifteen drops to three or four times that amount, and repeated every eight to ten days. The inconvenience is a persistent, burning pain. It is contraindicated during congestive attacks, when there is fever or hæmoptysis, or even small masses of blood in the expectoration; when there is intolerance or momentary saturation, or when albuminuria supervenes. The results obtained are a diminution and later disappearance of the thoracic pain; the dyspnœa is relieved; the cough, especially the nocturnal, becomes less frequent and less painful; the expectoration is less abundant, less discolored, although the bacilli are not diminished in number; the appetite is re-awakened, and at the same time the general condition improves; the sweats are less abundant, and, finally, auscultation shows that real progress is being made.—*Journal des Praticiens*, 1896, No. 9, p. 134.

### The Action of Sodium Bicarbonate.

M. G. Linossier considers the action of this substance upon the gastric secretion, particularly in relation to the memoir of Reichmann. The immediate action is the total or partial alkalization of the stomach-contents; this is produced without any participation of the gastric mucous membrane. Its physiological action consists in an excitation of the glandular cells of the stomach, which has for its result an exaggerated secretion of hydrochloric acid. The reasons for the errors which have been made in regard to this late action are to be found in the fact that only a single examination has been made. If this has been done prematurely, before the alkalinized gastric fluid has reacquired its alkalinity, then the conclusion has been reached that its action is depressive; or if the examination is made at the moment when the normal acidity has been neutralized, the conclusion is that it has no action; or, further, if the examination has been made late, and only if the dose is suitable, it may be said to have an excitant action. Reichmann made only a single examination, and in general an early one, sometimes about ten minutes after ingestion, more often after thirty minutes, and exceptionally after one and a half to two hours. Further, he made the error of not experimenting upon the same patient with variable doses, and of generally employing insufficient doses to provoke a notable excitation of the secretion. For these reasons, and the additional one that the duration of his experiments was too short, the result was that he reached the opinion that its action was either depressive or at least *nil.* The remote action of the drug can be summed up as follows: The sensibility of its action is in inverse ratio to the richness of the hydrochloric acid in the gastric secretion.—*Bulletin Général de Thérapeutique,* 1896, 4e liv., p. 155.

### THE THERAPEUTIC ACTION OF SALICYLIC ACID AND THE SALICYLATES.

M. G. PONCHET states that salicylic acid diminishes the activity of protoplasm, slows the organic processes of formation or retrogression, acts upon formed and soluble ferments, arrests the amœboid movements of leucocytes, and suspends diapedesis. On the other hand, thirty to forty-five grains produce cerebral congestion, accompanied by symptoms analogous to those observed from quinine-intoxication, notably tinnitus, disturbances of vision, and headache. Occasionally these attain to deafness and vertigo due to congestion of the middle and internal ear, which rarely may go on to true inflammation. Large doses produce hallucinations, delirium, profuse sweating, vomiting, and collapse. The kidneys may be the seat of hæmaturia, of hemorrhage, and albuminuria. In a healthy man neither pulse nor temperature is changed. But in animals, after poisonous doses, there is a marked depression of the vascular tension, paralysis immobilizes the organs of respiration, and death follows convulsions, caused by carbon-dioxide poisoning. In man, if ingested by the stomach, the sharp taste and vigorous irritation of mucous membrane, which may go on to nausea and vomiting and give place to burning sensations, are noted. Sometimes colicky pains, accompanied by diarrhœa, follow its administration to dogs. These symptoms should not be produced in man if the injunction, never to prescribe the sodium salicylate in powder or in concentrated solution, is followed. The only inconvenience, if the drug is properly administered, lies in a temporary intolerance, after prolonged administration, showing itself as a disgust for food as complete as after the use of an alkaline water or after alcoholic drinks. Salicylic acid is diffused through the organism with great rapidity; in healthy individuals it stimulates the urinary flow by irritating the renal epithelium, as does potassium nitrate, but this effect is diminished as inflammation develops. In inflammatory conditions of the kidneys and in severe general affections this secretion may be retarded or diminished; for instance, in typhoid patients it may produce a true urinary break-down. We find the urinary solids increased, phosphoric acid, the sulphates, carbonates, and preformed sulphates, the latter and, as a consequence, the phenol show that some of the acid has undergone decomposition. There is also a remarkable elimination of uric acid, even more notable than that produced by lithium; in fact, lithium salicylate is an excellent evacuant of the urates. The saliva is sometimes, the perspiration and bile always, increased. Sodium salicylate is an energetic cholagogue in small doses, fifteen to thirty grains; it increases and liquefies the bile, attaining its maximum action in two to three hours after its administration; but gentle purgatives should be associated with it to stimulate intestinal peristalsis. However, it may give rise to hepatic congestion more or less intense, sometimes obliging the discontinuance of the drug.

The physiological action of salicylic acid can be summed up in the statement that it diminishes the vital activity of protoplasm It is a specific in acute articular rheumatism and in gout, showing itself by a special action exercised not upon a cause still unknown in its real essence, but on account of the power of the anatomical element to sustain this cause and react under its influence. This, however, does not exclude a true specific action upon a cause still unknown, analogous to that exercised by quinine upon the blood-parasites of paludism or mercury upon syphilis. Besides this specific action, which may be called a special antiseptic, there is a general antiseptic one, which may be useful in variola, diarrhœa, diphtheria, and orchitis after blennorrhagia. It is antithermic, but this is not a therapeutic property, for it is the first symptom of the toxic action. To characterize in few words the remarkable specific action of this drug: It is a remedy of a symptom, and not of a diathesis; its use relieves only temporary accidents, preventing neither their production nor return, nor indeed their complications, as does quinine the accidents of paludism, or mercury those of syphilis. —*Les Nouveaux Rèmedes*, 1896, No. 3, p. 57, and No. 4, p. 89.

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## THE EFFECT OF DIPHTHERITIC TOXIN UPON THE HISTOLOGICAL ELEMENTS OF THE NERVOUS SYSTEM.

DOTT. CARLO CENI, from his studies, concludes that in patients dying of diphtheria we cannot always recognize appreciable morphological changes in the nervous elements, especially if death has taken place early. Experimentally in rabbits subjected to inoculations with diphtheritic bacilli or to injection with diphtheria toxin, death is constantly accompanied by marked morphological alteration in the nervous elements. The intensity of the alteration depends not so much upon the amount as the duration of the toxic action. In patients the general rule is that these changes are limited to the protoplasmic prolongations, leaving unaltered the cell-body and the nervous prolongations. Only in rare, special cases, through prolonged action of the diphtheritic toxin, the atrophic process of the nervous elements presents itself in a more advanced state, indicating alterations in form, both of the cell-body and nervous prolongations. In patients dying of diphtheria the incipient atrophic process of the nervous elements is limited to a few isolated cells disseminated through the encephalic mass; in animals, on the other hand, it extends to diffuse groups of cells, acquiring the character of a diffused alteration, more marked especially if death has taken place by slow poisoning. Individual conditions of acquired immunity show remarkably that these elements require an enormous resistance against the deleterious action of the diphtheritic toxin. Animals refractory to diphtheria can tolerate in their circulation even five hundred times the fatal dose of toxin without producing any change in the nerve-centres or elements.—*La Riforma Medica*, 1896, Nos. 29, p. 338; 30, p. 351; 31, p. 363.

## THE PREVENTIVE ACTION OF QUININE IN PALUDISM.

M. LABORDE believes that this is no longer in doubt. If this is not everywhere admitted at present, it is because the rational indications have not been studied and the choice of preparation, its form, and appropriate dose made out. In general, too small doses and too long intervals have been the sources of failures. In general, one and one-half to three grains every day, according to the severity of the service, seem to be sufficient. The objection to the continued use of the drug that it presents, among other inconveniences, that of habituation, so that its specific activity may be lessened or abolished at the time when its intervention is absolutely necessary, is not of sufficient weight to induce complete reliance to be placed, as do Kelsch and Kiener, upon the habit of not exposing one's self, when fasting, to fever-producing emanations, and the use of tonic drinks, coffee, tea, and alcohol in small doses.—*Journal des Praticiens*, 1896, No. 10, p. 155.

## THE GASTRIC CRISES OF TABES DORSALIS.

M. H. HUCHARD calls attention to the fact that in 1885 Sahli noted that these crises depended upon an attack of deficient hydrochloric acid, and should be treated by sodium bicarbonate, two and one-half to three and one-half drachms *per diem*. More recent work tends to point out that the proper treatment during the crises and hypopepsia is absolute rest, and, for food, undercooked eggs, some vegetable *purées*, crust of bread, and, for drinks, water, but no milk. During the period of quiescence or hypopepsia (hydrochloric acid equalling zero), sodium bicarbonate in from fifteen to thirty grains, an hour before meals; a solution of hydrochloric and lactic acids (hydrochloric acid, 1; lactic acid, 5; water, 500); a Madeira glass, after meals. For food, *purées* of feculent vegetables, some meats well cooked, boiled and chopped eggs, and water to which is added a little wine.—*Journal des Praticiens*, 1896, No. 8, p. 114.

## GUAIACOL AS A TOPICAL APPLICATION IN DIPHTHERIA.

DR S. SOLIS-COHEN states that this drug early used seems to destroy the bacilli and prevent the spread of the pseudo-membrane. Bacteriological examination of cultures taken from the same throat before and after its application has shown in the first instance the bacilli, and in the second none have been found. The formula is guaiacol, 10; menthol, 1; sterilized olive oil, 10. The same application is of service as a prophylactic against diphtheria by application to the throat of the healthy inmates of the house in which the disease has appeared. This has been proved by Elwyn in two epidemics. In folliculous tonsillitis it is capable of cutting short the disease if early and thoroughly applied, and even in parenchymatous tonsillitis mitigates considerably the severity of the affection.—*Philadelphia Polyclinic*, 1896, No. 16, p. 157.

### A Possible Explanation of Sudden Death after the Administration of Diphtheria Antitoxin.

Dr. C. B. Fitzpatrick suggests that the cause of death of a male infant, aged twenty-one months, who died suddenly while in perfect health, in consequence of an injection of this substance, may have been due to the carbolic acid which is known to have been present. This is present to the amount of 5 per cent., and the dose administered contained between three-fourths and four-fifths of a grain. The patient in question received about five times the safe dose, and, inasmuch as the minimal fatal dose is unknown, perhaps a fatal dose.—*The Medical Record*, 1896, No. 1328, p. 571.

### The Treatment of Cancer and Sarcoma by Forced Alimentation and the Use of the Toxin of Erysipelas.

Dr. B. H. Detwiler reports five instances. Hypernutrition was instituted in the form of large quantities of concentrated peptonized liquid food, with from one to two pints daily of a very superior old port wine, independent of the usual food. The cases were: 1. Cancer of the spine by metastasis from the breast, with a renewal of the disease in the cicatrix of the breast. 2. Cancer of the uterus. 3. Ulcerating surface after removal of one breast, with involvement of the other. 4. Immense sarcoma of liver. 5. Rapidly growing sarcoma of the neck. So far as the toxin injections were concerned, they were barren of results, although there were temporary good effects from the hypernutrition.—*Therapeutic Gazette*, 1896, No. 3, p. 149.

### The Treatment of Enteritis.

Dr. Edward P. Davis states that in the artificial feeding of infants cleanliness, the scalding (not boiling) of milk, and its administration at regular intervals are essential. In weakly, marasmatic babies the milk should be partially digested; this is readily done with the peptogenic milk-powder. Barley-water, 1 to 32, is a valuable addition to the diet, exerting an astringent action in case of diarrhœa. Oatmeal-water of the same strength exerts a laxative action. If the child vomits, is feverish, and has frequent stools, the milk should be stopped altogether for twenty-four to thirty-six hours and albumin-water substituted. The latter is prepared by adding the white of one raw egg to eight ounces of water; in addition, the child should get light chicken- or mutton-broth or freshly extracted beef-juice. Brandy and water form a good stimulant, and may be administered in ten-drop doses six or eight times daily. The administration of a dose of castor-oil, guarded by some brandy to prevent griping, is of exceeding value to clean out the irritating material from the intestines. Lavage of the intestines is of first importance in intestinal infantile disorders. It is accomplished by the use of a No. 11 or 12 soft-rubber catheter and a fountain-syringe, with one or two quarts of warm water. The best result is obtained if the infant is placed on its abdomen across the nurse's knees, the water being at a temperature of 100° F., and a little soda or salt added to it. Great relief is obtained from the evacuation of the flatus and feces. In chronic cases some antiseptic must be added to the water. For each quart of water the following may be added: Boric acid, four drachms; creolin, thirty drops; sodium salicylate, ten grains; thymol, seven and one-half grains; or mercuric chloride, one and one-half grains. The last should be followed by irrigation with warm water. The irrigation of the intestines not only cleanses them, but exerts a stimulant action upon the bowel.—*The Philadelphia Polyclinic*, 1896, No. 3, p. 221.

### The Use of Glycerin for Hepatic Colic.

Dr. Clemente Ferreira presents a strong plea for the use of one-half to one ounce of this substance, diluted with water, as an excellent resource against the painful attacks. If administered at the outset, it may abort them and even bring about a respite of long duration from the attacks.—*Bulletin Général de Thérapeutique*, 1896, 8 liv., p. 251.

### The Treatment of the Dyspepsias.

Dr. Albert Robin divides the premonitory dyspepsias into (1) those caused by excess of fluids and (2) excess of peptones. The latter can be readily relieved by a diminution of the quantity of food eaten. With the former there is a difficulty, because a sudden suppression of the abundant drink frequently gives rise to a very disturbing vertigo. The better plan is to allow the patient to drink according to his desire only, one or two hours after the meal. The true dyspepsias may be divided into (1) gastric hypersthenia; (2) hyposthenia or weakness; and (3) vicious fermentations. The first class is divided into those of (1) neurotic origin (without lesion); (2) central nervous origin; and (3) gastric or reflex. The first of these has been named gastroxynsis by Rossbach, and should be treated expectantly and particularly by hygienic methods; absolute intellectual repose, open-air exercise in the country, in the mountains for excitable patients, but for those in need of stimulation at the seashore. For the second, in connection with hysteria, tabes dorsalis, or general paralysis, great difficulties are encountered. The pain should be allayed by the usual means, and milk given in small quantities is well borne in the interval, but not during the crises. In the third there is greater opportunity for success. The antiseptics should be discarded, because they interfere with the action of the soluble ferments. The usual remedy is sodium bicarbonate, in order to saturate the free acids of the gastric fluid, but rather in small dose, in order to avoid the production of a large amount of sodium chloride, from which hydrochloric acid can be elaborated. To suppress the condition of the crisis, that is to say, to neutralize the excess of acidity, chalk, or, better, magnesia is used, and with the additional advantage that it is of itself an excellent laxative. The formula employed is: Calcined magnesia, 22; bismuth subnitrate, 3 to 10; morphine hydrochlorate, $\frac{1}{64}$ to $\frac{1}{32}$; sodium bicarbonate, 15; lactose, 7 grains. This is to be taken in one dose, in water, at the moment of the attack. In addition, hydrotherapy renders good service. In the treatment of permanent gastric hypersthenia, of which the most striking symptom is *hyperchlorhydrie*, it is not necessary to saturate the excess of acid by large doses of alkaline bicarbonate; but rather we should use calcined or hydrated magnesia, given in small doses and three or four hours after the meal, at the time that the albuminoids are digested and the syntonins are being formed. Further than this, the excess of hydrochloric acid can be saturated by taking before each meal one or two cachets containing washed sulphur, 2; potassium bitartrate, 15; and magnesia, 3 grains. In other cases the same result may be obtained by the use of salts of the organic acids or cream of tartar, potassium bitartrate, *sel de Seignette* [potassium and sodium tartrate], in thirty to forty-grain doses, thrice daily, which are eliminated as alkaline carbonates. Rarely, in acute attacks, it may be necessary to administer milk or raw eggs, three or four hours after the meal, to fix, with the contained albumin, the hydrochloric acid and prevent its action upon the mucous membrane. Gastric excitability may be relieved by a milk diet for about a week. Later, two to six eggs underdone, finally reaching ordinary diet in about a fortnight. Fish, especially the lean, with lemon only as condiment, are preliminary to a full diet. Various indigestible substances, acids (exception noted above), raw vegetables and fruits, all of the cabbage family, butter, cheese, smoked meats, long-kept game, truffles, wines, and alcohol are prohibited. Pure water is best for drinking; next comes those feebly mineralized, and skimmed milk. Light beers are good, provided they are well fermented and are not acid. Coffee and tea are allowed if their use is not followed by nervous excitement. The pathological phenomena which we must combat are (1) hypersecretion of the mucous membrane, which exceeds the physiological necessities, and an exaggerated afflux of blood; and (2) rarely a diminished amount of pepsin. For the first indication, to diminish the reflexes may be given veratrum viride, cocculus indicus, cannabis indica, opium, belladonna, or cocaine—the last with great care and in small dose. For the hyperæmia, ergotin, 3, in distilled water, 4; dissolved, filtered, and mixed drop by drop with tincture of cocculus indicus, veratrum viride, belladonna, and anise, of each, 5; and of this six to ten drops before the two principal meals. For the second condition, pepsin, capable of digesting fifty times its weight of fibrin, 5; with diastase, 2 grains; and in addition pancreatin, in two to four-grain keratin-coated pills, may be given. Various springs also are apparently of benefit in these conditions. The treatment of gastric hyposthenia or functional insufficiency, showing itself in a diminution of the hydrochloric acid, does not call for the administration of this acid unless the gastric glands are certainly destroyed. Milk is prohibited; meat must be used with great care, and only when finely divided. The starchy vegetables should constitute the bulk of the food, but always finely divided. All condiments are useful, and for fluids light white wines mixed with stimulating mineral waters, as Condillac, Pougues, or Soultzmatt. Good red wines, particularly old Bourgogne, are well borne when they produce a favorable stimulation. Of the drugs, bitter tonics, potassium salts, sodium bicarbonate, which stimulate the stomach functions, and small doses of ipecacuanha, which excites the muscular apparatus, are indicated. Various bitters of complex formulas may be recommended. Patients suffering from this condition are markedly benefited by a sojourn at Vichy, Pougues, Saint-Nectaire, Carlsbad, and Homburg. At one's home the waters of Sautenay and Maizières, which bear transportation, may be used. If intestinal phenomena complicate the gastric, the waters of Châtel-Guyon, Royat, or Kissingen are indicated.—*Bulletin Gênéral de Thérapeutique*, 1896, 4e liv., p. 145; 5e liv., p. 193; 7e liv., p. 289; 8e liv., p. 337; 9e liv., p. 391.

## Immunity in Asiatic Cholera.

Dott. G. Galeotti has made a study of immunization of guinea-pigs against experimental choleraic peritonitis in order to discover the substance either in a culture of the bacilli or in the blood-serum of an animal strongly vaccinated against this micro-organism. From the culture were extracted (1) divers albumins; (2) a peptone; (3) a nucleo-proteid, which is probably a constituent of the bacterial cell. No substance extracted from the culture by alcohol, ether, or chloroform showed any value for vaccination. From the serum of vaccinated animals were separately isolated globulin, resins, fibrin, and a proteid substance of undetermined origin capable of dialysis. All these substances showed strong vaccinal properties. As to how these substances act this much can be said: They do not possess either a bactericidal or antitoxic power, but are capable of stimulating in a living guinea-pig a bactericidal power of an unknown nature, which the animal normally does not possess.—*La Settimana Medica*, 1896, No. 19, p. 239.

## The Use of Antitoxin in the Treatment of Diphtheria in Private Practice.

The report of the American Pædiatric Society based upon its collective investigation presents for analysis the results in 3384 cases which occurred in the practice of 613 physicians. In addition two series of cases, one treated in the tenements of New York and the other a partial report from the inspectors of the Health Department of Chicago, are included. The report may be summarized as follows: More than six hundred of these physicians have pronounced themselves as strongly in favor of the serum-treatment. The localities from which reports have been received are so widely separated that no peculiarity of local conditions can account for the favorable record. Doubtful cases which have recovered have been excluded, while doubtful cases which were fatal have been included. No new cases of sudden death immediately after injection have been returned. The number of cases injected reasonably early, in which the serum did not appear to influence favorably the progress of the disease, was but nineteen; nine of these were of doubtful diagnosis, four cases complicated measles, three were malignant, and in two the serum was of uncertain strength and of doubtful value. In three cases the patients appeared to have been made worse; of these, in but one may the result be fairly attributed to the injection. The general mortality was 12.3 per cent.; excluding the cases moribund at the time of the injection or dying within twenty-four hours, it was 8.8 per cent. The most striking improvement was seen in the cases injected during the first three days; here the mortality was 7.3 per cent.—excluding cases as above, 4.8 per cent. The mortality of cases injected on or after the fourth day was 27 per cent. Of the laryngeal cases (membranous croup) one-half recovered without operation; in a large proportion of cases the symptoms of stenosis were severe. Of the cases upon which intubation was performed the mortality was 25.9 per cent., or less than one-half as great as has ever been reported under any other method of treatment. Broncho-pneumonia occurred in 5.9 per cent. In contrast to the two or three instances in which the serum is believed to have acted unfavorably upon the heart may be cited a large number in which there was distinct improvement in its action after the serum was injected. There is little if any evidence to show that nephritis was caused in any case by the injection of serum. The effect upon the nervous system is less marked than upon any other part of the body, paralytic *sequelæ* being recorded in 9.7 per cent. of the cases. The most concentrated strength of an absolutely reliable preparation should be administered as early as possible on a clinical diagnosis, not waiting for a bacteriological culture. However late the first observation is made, an injection should be given unless the progress of the case is favorable and satisfactory. The dosage for a child over two years old should be, in all laryngeal cases with stenosis and in all other severe cases, 1500 to 2000 units for the first injection, to be repeated in from eighteen to twenty-four hours if there is no improvement. A third dose after a similar interval may be necessary. For severe cases in children under two years, and for mild cases over that age, the initial dose should be 1000 units, to be repeated as above if necessary; a second dose is not usually required. The dosage should be always estimated in antitoxin units and not in the amount of serum.—*Pædiatrics*, 1896, No. 1, Supplement.

## SUDDEN DEATH AFTER A PREVENTIVE INJECTION OF BEHRING'S ANTITOXIN.

DR. R. PALTAUF, noting the previously reported cases of Maizard, Quinon, and Alföldi, claims that these were not definite in that thorough examinations were not made. It is admitted that local and general erythemata, exanthemata, even marked fever, may arise, and occasionally joint-symptoms, but denies that a fatal case has resulted or that permanent injury has been done. The beneficial influence of the serum upon diphtheria is incontestable, and the assumption that death is due to its action only prevents its use through the anxiety, of the laity, to which these reports give rise. Instances of sudden death in children are not uncommon, and may be attributed to causes not found save after especial examination. Among these may be cited acute interstitial myocarditis, the lymphatic-chlorotic constitution of rhachitis.—*Wiener klinische Wochenschrift*, 1896, No. 16, S. 297.

## THE TREATMENT OF SCARLET FEVER.

M. E. APERT reports that two attempts in severe cases with the serum of Marmorek (*cf.* THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES, 1896, No. 290, p. 745) were not encouraging. The ordinary treatment is a milk-diet, fifteen to thirty grains of ammonium acetate daily during the period of eruption, buccal irrigations of aromatic boiled water, and an injection into the nasal cavities of 2 per cent. of menthol in oil.

M. COMBY states that the mortality of this disease treated by injections of Marmorek's serum was 8 per cent., while in the same pavilion the previous mortality was 5 per cent. Not only did the antistreptococcic serum fail to lower the mortality, but it did not prevent the complications due to the streptococcus. One can say that its value is *nil* in the treatment of this disease.—*Journal des Praticens*, 1896, No. 20, p. 317.

### DEATH FOLLOWING ANTIDIPHTHERITIC SERUM.

M. VARIAT reports a single observation. A child of eighteen months suffered from a slight pharyngeal diphtheria, followed by croup. After intubation five drachms of serum were administered. Death resulted in forty-eight hours; the temperature was 105° F. On necropsy nothing was found to indicate the cause of death. The pharnyx and larynx were entirely free from membrane and appeared healthy.—*La Semaine Médicale*, 1896, No. 22, p. 173.

### THE CAUSE OF SUDDEN DEATH FROM ANTITOXIN INJECTIONS.

DRS. A. SEIBERT and F. SCHWYZER, from laboratory-experiments, conclude that: (1) Antitoxic serum does not seem to be capable of causing threatening symptoms and speedy death even when brought quickly into the blood-current in very large doses. 2. The carbolic acid used as preservative must be in such a weak solution as to be unable to cause the characteristic carbolic convulsions. 3. Even very small quantities of air will cause severe disturbances and ultimate cessation of breathing, and to this cause the authors attribute the sudden deaths reported.—*New York Medical Record*, 1896, No. 913, p. 708.

### TREATMENT OF SNAKE-BITE WITH ANTIVENENE.

DR. FRASER cannot as yet adduce any actual experience of its use in human beings, although a considerable quantity in both the liquid and dry state has been sent to India and Africa. Other remedies, however, should be used which may assist the action of this antidote in preventing death and also by prolonging life increase the opportunity for a more thorough use of it; such would be medicines which increase secretion—diaphoretics and diuretics—rapidly acting stimulants of the circulation, alcohol and the old snake-remedy, ammonia; stimulants of the respiration, atropine and strychnine; the latter of which has received attention. Certain auxiliary measures, as the application of a ligature, removal of the venom by opening up wounds, and suction, are useful. The dose varies with the amount of venom, conditions of administration of the remedy, and time which has elapsed since the bite. The symptoms do not give information as to the quantity of venom received. Probably eleven and one-half ounces would be required surely to antidote the poison if injected not much longer than thirty minutes after the bite had been inflicted; possibly four ounces may be sufficient. The bulk, however, may be reduced one-half by dissolving the dried antivenene. Even with this substance in its present condition human life may be saved in a considerable, if not in large, proportion of cases of snake-bite which would otherwise terminate in death.—*British Medical Journal*, 1896, No. 1842, p. 957.

### A Smallpox Antitoxin.

Dr. S. Monckton Copeman records the well-known fact that vaccination is practically of no avail when once smallpox has become developed. The recent contributions of Béclère, Chambon, and Ménard tend to show that the serum of a vaccinated heifer, gathered after the drying of the pustules, immunized to a certain extent against the effects of subsequent vaccination, but the antagonism is by no means complete. Better results might probably be obtained by employing colts instead of calves for production of the serum, since, as Chauveau has shown, an inoculation of colts not infrequently gives rise to a generalized eruption, the effect of which on the system is likely to be more potent than when the reaction, as is the case with calves, is limited to the area of inoculation. If further investigation should be attended with a greater measure of success than has at present been attained, we may hope before long to be in possession of an effectual method for the treatment of those cases in which the system has already became invaded by smallpox, which would form a fitting complement to the Jennerian process of preventive vaccination.—*British Medical Journal*, 1896, No. 1847, p. 1277.

### The Use of Vaccine Virus.

Dr. Francis Martin uses ivory points, making two sets of scarifications —a half-dozen short lines close together—about two inches apart with a dull bleeding-lancet, cutting just deeply enough through the skin to draw a tinge of serum and blood. These lines are crossed with a similar set of cuts at right-angles. The virus is thoroughly dissolved on the point with a little water, the cuts wiped thoroughly, and it is immediately rubbed into the cuts for ten seconds with the flat side of the point. The arm is exposed to the air for one minute. No plaster or subsequent dressing is necessary. The arm should be washed at bedtime. In three or four days the vesicle will begin to appear, and will be at its height in about eight to nine days, after which it will decline. Unless the crust is broken, there will be no severe symptoms with good virus, and, indeed, there should never be bad and sloughing arms if the patient is in any reasonably healthy condition at the time.—*Medical Record*, 1896, No. 1334, p. 757.

### The Administration of Thyroid Gland.

Dr. H. Huchard prefers the administration of the gland in its natural condition to subcutaneous injections of the juice or its extract, because there is no risk of introducing into the syringe septic material, and there is always the assurance that the gland is in a fresh condition. The gland from the sheep should always be used on account of the absence of tuberculosis in this animal. The dose is one lobe, fifteen to twenty grains, in bouillon, slightly fried or raw when cut in small morsels.—*Journal des Praticiens*, 1896, No. 16, p. 242.

# MEDICINE.

UNDER THE CHARGE OF

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## The Changes in the Blood in Hæmoglobinuria.

Vacquez and Marcano report the result of their examination of the blood in a case of the so-called idiopathic hæmoglobinuria. The disease was of the paroxysmal form, and occurred in a young man in whom the only possible assignable cause was malaria, which he had suffered from some years previously. At the time he was under observation he was perfectly free from malaria, and no other organic disease could be made out; the urine, however, contained a small amount of serum-albumin.

The examination of the blood was made before, during, and after a paroxysm.

It was found that six hours after the attack the red corpuscles had diminished 400,000 in number, and twenty-four hours later the count showed a diminution of 1,000,000. The diminution in hæmoglobin was not proportionate with the diminution in red corpuscles, but was considerably greater than would have been expected, and the regeneration of the hæmoglobin was not so rapid as that of the red corpuscles.

The alteration in the appearance of the red corpuscles, already described by Hayem, was observed, viz.: That certain corpuscles had the appearance of losing their color gradually. The white corpuscles showed no special change. The authors state, in conclusion:

1. That hæmoglobinuria is rarely pure; it is generally accompanied by a real destruction of red blood-corpuscles at the moment of the attack.

2. The loss of hæmoglobin greatly surpasses the loss of red corpuscles, as in one case the loss of hæmoglobin equalled one-third of the normal, while the loss of red corpuscles only equalled one-ninth of the normal.

3. The resistance of the blood is much diminished at the time of the attack. On testing by Melassez's method it is found that the red corpuscles destroyed at the end of twenty-four hours during the attack are equivalent to one-third of the total count, while during the normal state not one-quarter of the normal count are destroyed.

4. The so-called paroxysmal hæmoglobinuria being only a symptom, aud not a morbid entity, it is important to examine in every case the modifications in the blood in order to find out if different varieties of hæmoglobinuria are associated with different changes in the blood. If this proves to be the case the blood-examination will be of great help in establishing a rational classification of these cases.—*Archives de Médecine Expérimentale*, January, 1896.

## GAUCHER'S DISEASE.

Under the heading of primary epithelioma of the spleen PICOU and RAMOND describe a case, of which only one other example is reported, that of Gaucher, whose name has been given to the disease.

The patient was a young woman, aged thirty-two years, and presented the same clinical picture as Gaucher's original case, the main points of which are as follows:

The disease comes on in an insidious manner, with enlargement of the spleen, accompanied by dull pain in the left hypochondriac region. The hypertrophy of the spleen is accompanied by an increase in the size of the liver, and almost the entire abdomen may be filled by these viscera at an early date. There is no ascites. The hypertrophy of the organs is smooth and regular.

The functional symptoms are the pain above mentioned and also symptoms due to compression, dyspepsia, constipation, dyspnœa, frequent urination, œdema, and at times cramps of the lower limbs.

Hemorrhages are one of the most marked features of the disease; they take the form of epistaxis, subcutaneous hemorrhages, etc. The gums become soft and spongy, like those of scorbutus. Slight icterus may occur. Two symptoms upon which Gaucher lays particular stress are the complete absence of glandular enlargement and anæmia without leukæmia. The duration of the disease is protracted.

The main anatomical lesions consist in the hypertrophy of the spleen and liver. Both organs retain their original shape, and their surfaces remain smooth.

The color of the spleen is described as violet, paler than normal. The splenic parenchyma is sclerosed, and the trabeculæ of the organ are much thickened.

Microscopic sections of the spleen show that its proper substance is destroyed, and its place taken by alveoli, formed of the thickened trabeculæ, filled with large cells with sharply defined nuclei. The liver presents the macroscopical lesions of cirrhosis, the increase in connective-tissue being both peri- and intra-lobular.

According to Picou and Ramond, the tumor of the spleen resembles somewhat endothelioma, but they were unable to trace an endothelial origin in their case, and so are inclined to regard it as a carcinoma.—*Archives de Médecine Expérimentale*, March, 1896.

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## TETRAGENUS SEPTICÆMIA.

In a recent article CHAUFFARD and RAMOND report two interesting cases of septicæmia occurring in human beings due to the micrococcus tetragenus of Gaffky.

The organism has been described before as a cause of local infection and as a frequent inhabitant of phthisical cavities, but these are the first reported cases, the authors think, of general infection due to it.

The first case was that of a girl, aged fifteen years, in whom, following la grippe, a polyarthritis appeared, attacking the hips, knee, thumb, shoulder, and elbow-joints, and accompanied by chills, an erythematous skin eruption, and great dyspnœa. The patient died on the eleventh day from the onset of the disease. The second case was that of a young man who was taken with chills, nausea, and headache, followed by great swelling of the right knee-joint. This was followed later by extensive infiltration of the right hip and leg, and enlargement of the inguinal glands. On the tongue was an ulceration, opposite to a carious tooth containing a cavity. The patient died in spite of operative interference ten days from the onset of the disease. In the first case the right knee was aspirated during life and eight centimetres of a chocolate-colored pus, containing numerous oil-drops, were evacuated.

At the autopsy the lesions of a general infection were present. There were pericarditis and pleuritis, the pericardium and pleura containing fluid, on the surface of which floated many oil-drops. In the wall of the left ventricle were foci of purulent myocarditis with abscess-formation, and in one segment of the tricuspid valve was a small, round ulcer of one centimetre in diameter and unaccompanied by any vegetative process. The lungs showed one or two infarcts. All of the organs contained abscesses whose contents had a caseo-fatty appearance.

In the second case no autopsy was obtained, but cultures were made during life from the ulcer of the tongue, the cavity in the tooth, and from the infected knee.

In the first case cultures from all the organs with the exception of those from the lung gave a pure growth of an organism which corresponded in every way to the micrococcus tetragenus of Gaffky. In the lung infarct the colon-bacillus was also present.

In the second case the tetragenus was present in large numbers in the cultures from the carious tooth and the tongue ulcer, and in pure culture from the knee-joint.

The organism from each case was pathogenic for animals, and the oily appearance of the pus was noted in them as in the original cases.

The authors conclude that the tetragenus is capable of causing general infections in man, as had been previously suspected from its pathogenicity in animals.—*Archives de Médecine Expérimentale*, May, 1896.

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### HEMORRHAGIC MYXŒDEMA WITH CONTRACTURES.

Under the title of "Myxodermie Contracturante Hemorrhagique," DE BRUN has recently described what he considers to be a new disease, which is characterized by the following phenomena:

The onset is sudden, with high fever, malaise, vomiting, headache, and the rapid appearance of typhoid phenomena, with great agitation at night. The delirium is often violent. The temperature-curve divides itself into three periods:

1. Rapid rise of the temperature to 39° C., the temperature remaining between 39° C. and 40° C. for from eight to ten days.
2. Apyrexia or even hypothermy for eight days.
3. The temperature again rises to 39° C.

During the disease there is a general contracture of the muscles, especially those of the face and neck and the muscles of mastication. The skin becomes "malleable" like soft wax, and subcutaneous hemorrhages in the form of ecchymoses, surrounded by a white, painful zone, appear in the third period of the disease.

There is absence of meteorism and rose spots.

The disease lasts from three to four months. The prognosis is grave. The cause has not yet been discovered.—*La Presse Médicale*, May 13, 1896.

### PERICARDITIC PSEUDO-CIRRHOSIS OF THE LIVER.

F. PICK (*Zeitschrift für klin. med.*, Bd. xxix. p. 385) publishes an interesting article, the substance of which he gives in the following conclusions:

1. There are cases resembling precisely the mixed form of cirrhosis of the liver, with enlargement of the liver and marked ascites, but without jaundice, which are due to a latent pericarditis. This causes disturbances in the circulation of the liver which lead to connective-tissue overgrowth and to most intense ascites through congestion of the portal circulation.
2. This occurs especially in early life, but may also be observed in old age.
3. In the differential diagnosis the following points are important: The absence of an etiological factor for cirrhosis, a history of pericarditis, and a previous œdema of the legs. An accurate result can only be obtained through a complete examination of the heart.

### THE ETIOLOGY OF SEROUS PLEURISY.

ASCHOFF has analyzed the cases of pleurisy in Albert Fraenkel's wards, and has made a useful contribution to our knowledge of that subject.

Two hundred cases were examined with reference to the questions: Is there an "idiopathic," non-tuberculous, serous pleurisy? Is there an acute rheumatic pleurisy, equivalent to a previous acute arthritis? Are there serous exudates, with pyogenic organisms, which do not become purulent?

The exudates were examined by inoculating three agar-tubes each with three large drops and keeping the tubes at 37° C. Fresh and stained preparations of the fluid were also examined. In twenty cases intraperitoneal inoculations were made in white mice. Forty-three of the 200 cases were demonstrated to be tuberculous by finding bacilli in the sputum or other products. Nineteen more had the suspicion of tuberculosis in the history. Of the 200 cases only seven gave a positive result when examined for bacteria. Out of seventeen inoculations only two, belonging to the seven just mentioned, gave positive results. These were a case of sepsis and one of tuberculosis. The others were: metapneumonic, 2; so-called idiopathic, 2; one of each showing streptococci and one pneumococci; one following gangrene of the lung with streptococci. The first two patients died. In the other five the exudates became purulent ultimately. Operation is not always necessary in such cases. Some recover spontaneously, so that recovery in case of pleurisy does not prove a non-purulent exudate. In all the rest of the 193 cases bacteriological examination was negative. The author answers the possible criticism that his negative results were due to the small amount of exudate used. Perhaps a more pertinent objection, not mentioned, is that anaërobic cultures should have been made. The most interesting cases were those in which there was demonstrable or suspected tuberculosis, and the so-called idiopathic cases. Of thirteen belonging to the first class, inoculations in guinea-pigs gave positive results in seven. Of inoculations in twelve suspected cases, three were negative. A similar proportion was observed in the so-called idiopathic cases, nine out of twelve causing tuberculosis in guinea-pigs. This confirms the view that most cases of idiopathic pleurisy are tuberculous. That such cases may recover completely is emphasized by the author. Aschoff thinks it very doubtful whether rheumatic pleurisy ever occurs without the joints or the heart being also affected. In the sixteen cases observed by him a complication on the part of the heart was not missed once. As regards the question of serous exudate and pyogenic bacteria, the author draws the conclusion that such exudates are almost always free from bacteria. If pyogenic organisms are present, suppuration is likely to occur sooner or later. This is not so often the case when pneumococci are present, probably by reason of the early death of those organisms. The author holds that the spontaneous recovery of serous pleurisy is not uncommon, and that salicylic acid has no advantage in its treatment.—*Zeitschrift für klin. Med.*, Bd. xxix. p. 440.

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## GASTROSCOPY.

PERL (*Zeitschrift für klin. Med.*, Bd. xxix. p. 494) has made some observations which throw much light on the difficult subject of gastroscopy. The position and shape of the cardia were learned by making plaster-of-Paris casts. These show that the subphrenic part of the œsophagus is more fixed than the thoracic part, and that its direction is usually toward the left. The cardia was usually found at the level of the twelfth dorsal vertebra. The average length from the incisors to the cardia was found to be 60 cm. In passing metallic sounds of 12 mm. diameter the instrument is introduced at the right angle of the mouth, by which the difficulty presented by the turn to the left in the lower part is overcome. Out of twenty-three men only three failures were met with ; out of ten women only one—a much more favorable showing than most investigators have been able to make. In some cases the passage of the instrument is hindered by a spasm of the œsophagus, usually of neurasthenic origin. A natural difficulty is presented by short and thickset persons, in whom the passage of an œsophageal sound may be impossible. Other obstacles are exudates, tumors of the liver or stomach, and curvature of the spine.

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## THE DIAGNOSIS OF CYSTICERCUS IN THE BRAIN.

MORITZ (*St. Petersburger med. Wochenschrift*, 1896, No. 10) had a case in which the diagnosis of benign tumor in the posterior fossa was made during life. Autopsy showed a cysticercus cyst as large as a hen's-egg. From a study of other reported cases, some of them closely resembling his own, Moritz draws the following conclusions as to the diagnosis of cysticercus in the brain when there are no external cysts :

1. There are signs of a severe afebrile, non-inflammatory disease of the brain, the chief symptoms being irritative.
2. Paretic symptoms speak against cysticercus, except in the last stage.

3. Choked disk is always present.
4. The exclusion of other brain-tumors is only possible by continued observation. Malignant new growths have a more uniform course. Gliomata sometimes show periods of improvement, but usually have more severe symptoms than has cysticercus. Isolated tubercles, which occur especially in the cerebellum, also have a protracted course, but with them pain, headache, and dizziness are more constant. Slowly growing cysticerci cause irregular exacerbations of convulsions, headache, and dizziness, alternating with periods of comparative comfort, the latter sometimes lasting weeks or months.
5. Death usually occurs in convulsion.

Abstracts of all the available cases are appended to this paper.

## SIMULATED PAROXYSMAL HÆMOGLOBINURIA.

RICHTER reports the case of a man, who, having had an extensive experience in hospitals, endeavored to simulate paroxysmal hæmoglobinuria. His urine contained blood, leucocytes, and detritus. The temperature rose to 42.2° C. As the patient had previously simulated hæmoptysis, and as he did not feel hot to the touch, notwithstanding the high temperature, and as his intellect was clear, the urine-glass was carefully watched and the temperature taken in the rectum. From that time the man remained free from symptoms.—*Prager med. Wochenschrift*, 1895, No. 35.

## THYROIODIN.

BAUMANN furnishes some interesting additions to our knowledge of this substance (*Münchener med. Wochenschrift*, 1896, No. 14; see THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES, May, 1896, p. 597).

The greater part of thyroiodin occurs in the gland in combination with two albuminous bodies, an albumin and a globulin, especially the former. The effect of thyroiodin on parenchymatous goitres, myxœdema, and obesity was found to be precisely like that of the gland itself. Observations on metabolism in men and animals gave the same results, and finally accidental intoxication from overdoses also showed the new substance to represent the characteristic constituents of thyroid gland. Experiments show that the action of thyroiodin is more prompt than that of the gland, which may be explained by the fact that it must be liberated from the gland by digestion.

A very interesting fact brought out by Baumann is that the amount of iodin in the thyroid is much greater in normal than in goitrous glands, and greater in non-goitrous than in goitrous localities. So in Freiburg, where goitre is common, the average amount of iodin in the thyroids of adults was found to be 2 mg., whereas in glands from Hamburg, though only half as large as the former, the average was 3½ mg. In children the difference was still greater. Disease other than goitre did not seem to affect the amount of iodin, which was not greater in the thyroid of suicides than in persons dying of various diseases. In early life and old age the amount is relatively small; greatest between twenty-five and fifty-five years. The kind of food, especially the use of sea-fish, has a marked effect on the amount of iodin in the gland.

Whether there is less iodin in the soil and water in goitre-districts is not known.

Later experiments have shown Baumann that the thymus (of calves) contains a small amount of iodin, an important fact in connection with the other, that the use of thymus in some cases of goitre has been followed by a diminution in the size of the gland. The use of iodin or iodoform causes an increase in the amount of iodin in the thyroid, sometimes as much as 20 to 30 mg. In the thyroid of a large dog, whose abdomen was repeatedly rubbed with iodoform, 48 mg. were found.

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## CROUPOUS PNEUMONIA AS A FATAL COMPLICATION OF DIABETES. SUGAR IN THE SPUTUM.

BUSSENIUS reports from Senator's clinic (*Berliner klin. Wochenschrift*, 1896, No. 14) the case of a woman, aged fifty years, who was found to be diabetic in February, 1895, was taken with pneumonia in November, and died on the eleventh day. On admission to the hospital the urine was found to contain glucose to the amount of 4.2 per cent. Sugar was present to the end, varying in relative and total amount, but increasing with the final crisis and falling just before death. The sputum contained one-fourth of 1 per cent. of sugar. This was said by Biermer to be a normal constituent of sputum, a statement afterward abandoned. From observations made by Bussenius, the latter thinks the small quantities of sugar occasionally found in the sputum of non-diabetics may be due to accidental contamination from food. The comparative rarity of pneumonia in diabetes appears from the experience of Senator, who, out of nearly 700 cases of diabetes, saw only seven cases of pneumonia, not counting one case of broncho-pneumonia and five of influenza-pneumonia. In none of these cases did the sugar disappear during the febrile period, though in one case it fell from 3.55 to 1.78 per cent. The prognosis is always unfavorable. It is impossible to say whether death is due to the pneumonia or to coma.

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## SYMMETRICAL GANGRENE—DEATH FROM APOPLEXY—ARTERIOSCLEROSIS.

THIERSCH (*Münchener med. Wochenschrift*, 1895, No. 48) reports the case of a man, aged thirty-five years, who for ten years had symmetrical gangrene, beginning in the toes. Later, the skin over the feet became livid and discolored. Death took place with symptoms of apoplexy. Autopsy showed hemorrhage in the left lateral ventricle and extensive and severe arteriosclerosis. The arteries of the legs were especially affected.

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## GLIOSIS IN EPILEPSY.

BLEULER (*Münchener med. Wochenschrift*, 1895, No. 33) has found an increase of the neuroglia-fibres in all of twenty-six cases of epilepsy. The hypertrophy occupies a position between the pia and the external tangential nerve-fibres. All the patients had had severe epileptic imbecility. Control-examinations of fifty-four brains, fifty-one from cases of insanity, three from persons free from mental symptoms, did not disclose a similar condition.

The histological picture was so striking that the sections from epileptic cases could easily be recognized. The author does not attempt to prove that the gliosis is the cause of the epilepsy, but believes it probable that the change is at least simultaneous, as it is not more marked in cases of long duration than in recent ones.

### Two Cases of Cerebral Spastic Diplegia.

Oppenheim observed this in a mother, aged thirty-one years, and her daughter, ten years. Ever since her childhood, perhaps from birth, the mother had motor disturbances in the muscles of the body, extremities, face, tongue, palate, pharynx, and larynx. The condition was one of paresis or paralysis, with spasms and athetosis. The intellect was well preserved, but the patient was perfectly dumb. The motions of crying and laughing were preserved. The expression was somewhat drawn; trismus was permanent; the muscles of the face moved with difficulty or sometimes involuntarily; motion of the tongue was difficult. There were distinct athetosis of the hands and spastic paralysis of the feet.

The daughter was able to speak only for the last year, and then with difficulty, but otherwise was in much the same condition as the mother. The spastic condition of the legs was not so marked, but there were the same facial expression, trismus, and difficulty of swallowing and chewing.—*Berliner klin. Wochenschrift*, 1895, No. 34.

### Cerebral Hemorrhage in Whooping-cough.

Oppenheim reports the following rare case: A lad of eight years suddenly became unconscious while sick with whooping-cough. At first there were no local symptoms. Later, the previous agitation subsided, complete somnolence followed. Gradually spasms began in the right side of the face, and extended over the whole right side. The convulsions came on in paroxysms, following closely after attacks of coughing. After three days the attacks became less frequent and severe. Paralysis of the right arm and leg, with absent reflexes on that side, then developed. On the sixth day the intellect began to clear up, though aphasia persisted until the tenth day. By the end of three weeks recovery was complete.

It appeared that the boy was in the habit of closing the mouth and nose at the beginning of a coughing-paroxysm, and to make strong expiratory efforts, in order to check the cough. It can hardly be doubted that this assisted in the production of a hemorrhage in the left hemisphere, as Oppenheim supposed.—*Deutsche med. Wochenschrift*, 1896, No. 17.

### Diphtheria and Antitoxin.

The Metropolitan Asylums Board of London has recently issued a statistical report on the use of antitoxin in diphtheria, as observed in six fever hospitals during 1895.

The statistics are based on a comparison with cases treated during 1894, when no antitoxin was used, this year being chosen on account of the fact that the mortality was exceptionally low at that time.

The tables show a general decrease in mortality of 7.1 per cent. in favor of 1895. The reduction is more striking if age and the day of the disease on which the antitoxin was administered are taken into account.

In the first quinquennium of life the results are most striking, and here the mortality is reduced 13.2 per cent. in 1895, lower than it was in 1894.

The necessity of administering the antitoxin early is forcibly shown by the statistics bearing on the relation between date of administration and mortality, as it is shown that those cases in which the antitoxin was administered on the first and second days show a mortality of 4.6 per cent. and 14.8 per cent., respectively, in 1895, as against 22.5 per cent. and 14.8 per cent. in 1894.

The mortality in laryngeal cases is also shown to be greatly reduced, the percentage in 1895 being 49.3 as compared to 70.4 in 1894.

The complications of the disease were apparently not influenced by the antitoxin, as cases showing complications were rather more numerous in 1895 than in 1894. That this was not due to the antitoxin is shown by comparing an equal number of cases in 1894 and 1895 not treated by antitoxin, when it is seen that the 1895 cases show a higher percentage of complications.

The authors summarize the results of their inquiry in the following conclusions:

1. There is a great reduction in the mortality of cases brought under the antitoxin treatment on the first and second days of the disease.
2. That in this series of hospitals the combined general mortality is below that of any other year.
3. That there is a particularly remarkable lowering of mortality in the laryngeal cases.
4. That there is a uniform improvement in tracheotomy results.
5. That there is a beneficial effect produced upon the clinical course of the disease.

They consider the value of the antitoxin to be demonstrated from the study of this large number (2182) of cases; and lay particular stress upon beginning the treatment as early as possible.—*Metropolitan Asylums Board. Report of the Medical Superintendents upon the Use of Antitoxic Serum in Diphtheria.* London, 1896.

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### URÆMIC APHASIA.

At a recent meeting of the Hospital Medical Society of Paris RENDU gave the history of a patient presenting this interesting condition.

The patient was a man of fifty-six years, and was admitted to the hospital with the history of having suddenly been seized with an apoplectic attack. The morning following admission he had regained consciousness, and his three main symptoms were aphasia, monoplegia of the right arm, and a systolic murmur at the base of the heart.

From these signs a diagnosis of cerebral embolism was made. Some days later the patient was seized with a sudden attack of intense dyspnœa, with Cheyne-Stokes breathing; the urine was scant and very albuminous, and the blood contained seventy-five centigrammes of urea to the litre. The diagnosis was then made of uræmic poisoning.

The patient was bled immediately, and recovered in a day or two, both the monoplegia and the aphasia entirely disappearing.

Rendu regarded the aphasia and partial paralysis as both being due to uræmic intoxication, and in the discussion Hanot expressed the opinion that the similar lesions which may take place in pneumonia and other infectious diseases were also toxic. Duflocq mentioned a case of aphasia occurring in the course of cholera, in which the autopsy showed no lesion whatever.—*Gazette Médicale de Paris*, April 4, 1896.

### THE MOBILITY OF ABDOMINAL TUMORS.

NOTHNAGEL (*Festschrift zur* 100 *jahr. Stiftungsfeier des Med.-Chir. Friedrich Wilhelms-Institutes*) in this article considers the mobility of abdominal tumors under four principal causes: Respiratory, or the motion of the diaphragm; the peristaltic motion of the stomach and intestines; external pressure; gravity.

1. All organs immediately beneath the diaphragm descend in inspiration and ascend in expiration. Diagnostic errors due to the inspiratory distention of the abdominal wall can only be avoided by experience. In the differential diagnosis of tumors of the liver and stomach the possibility of retaining the tumors in expiration is in favor of the stomach. Respiratory motions may be absent on account of pleurisy, emphysema, or adhesions, or in enormous enlargement of the liver or spleen, by which the contraction of the diaphragm is limited. The mobility of renal tumors, though slight, is important as contrasted with that of retroperitoneal neoplasms.

2. Tumors of the stomach and intestine may be moved by the peristaltic action of those organs, but the temporary disappearance of a tumor does not permit the conclusion that the growth is in the stomach or intestine. Peristaltic motion is usually limited, although sometimes it causes a considerable excursion.

3. Dislocated organs, such as the liver, spleen, and kidney, are easily moved by palpation unless adhesions have formed. Intestinal tumors are usually very movable, a fact of great importance in distinguishing between these and paratyphlitic exudates. Tumors of the stomach, especially the pylorus, have great passive mobility, but are not much influenced by respiration. Tumors of the gall-bladder, omentum, ovaries, and uterus are slightly movable, but abscess, circumscribed exudates, aneurisms, pancreatic tumors, tumors of the retroperitoneal glands, bones, and undescended testes are immovable.

4. Gravity influences especially tumors of the stomach and intestine.

### HEPATIC NEURALGIA.

PARISER, in the Congress for Internal Medicine (*Centralblatt für innere Med.*, 1896, No. 17, p. 467), reported seven cases of nervous hepatic colic. This is usually mistaken for gallstone colic, and in one case of the author's an operation was performed under the erroneous idea. The clinical picture is usually precisely like that of colic from calculus. Fürbringer thinks that in hepatic neuralgia the most intense pain is localized in the liver, and is not radiating, and although this is true in many cases, exceptions occur. The attacks last from a few minutes to four or more hours. As in biliary colic, the attack may end in vomiting. The disease is a visceral neurosis, with a neurasthenic or hysterical basis. The most successful treatment consisted in the use of tonics, the exclusion of exciting causes, and cannabis indica.

## Fibrinous Bronchitis.

Sokolowski (*Deutsches Archiv für klin. Med.*, Bd. lvi. p. 476) reports four cases of this uncommon disease, on which he was able to make some interesting observations. One case was remarkable for its long and steady course, without fever, with daily expectoration of bronchial casts and blood. The patient died of exhaustion, after four years. Physical examination, as well as repeated examinations of the sputum, gave no evidence of tuberculosis. There was never elastic tissue in the sputum. The author believes that the cases of so-called primary fibrinous bronchitis, in which tuberculosis was found post mortem, have really been cases of tuberculosis with the peculiar form of bronchitis as a complication. In another case the patient had all the symptoms of a severe septic infection, with chills, fever, and sweats, for more than three weeks. These symptoms led to a careful examination of the sputum, which contained staphylococcus albus and aureus. There seemed to be ground for believing the patient, a physician, was infected in the pathological laboratory. Staphylococci were also found in the sputum of a third case, in which the course was acute, began with chills and fever, and resembled influenza. In the sputum large numbers of Charcot's crystals and Curschmann's spirals were found. A similar case was reported by Zenker in 1876, and some after that by others, and from these the author draws the conclusion that fibrinous bronchitis and bronchial asthma have a close relationship.

The casts expectorated were found to be made up of leucocytes, mucus, and epithelial cells, with a small amount of fibrin. Many of the cells were in a condition of coagulation-necrosis.

Sokolowski formulates his views on the disease as follows:

1. Acute fibrinous bronchitis has the type of a pure infection, and is possibly due essentially to staphylococci (albus and aureus). Typical acute cases are rare, the milder forms being more frequent, and the latter are probably often overlooked or mistaken for asthma.
2. Chronic fibrinous bronchitis is an obscure process, with a different etiology, but included with the acute disease on account of the occurrence of the casts. The latter, however, may occur in other chronic diseases (tuberculosis, heart-disease).
3. Pulmonary tuberculosis appears to play only a subordinate *rôle* in the etiology of chronic fibrinous bronchitis.

## The Percussion of the Heart with the Body Inclined Forward.

Gumprecht (*Deutsches Archiv für klin. Med.*, Bd. lvii. p. 490), who has made an extensive series of observations, gives this subject a more important place in diagnosis than it has had hitherto. The most convenient position is to have the patient on the hands and knees, though the examination can be made with the patient standing, leaning forward, or sitting in a chair placed on a table. In this position the boundaries of the normal heart-dulness are the left edge of the sternum, the fourth rib, the left nipple-line, or as much as one and one-half cm. beyond it. The width of the heart-dulness as compared with the circumference of the thorax is as one to eight.

The greater the fraction the greater is the probability that the heart is enlarged. Of the advantages of the method the chief one is that the result is more easily obtained than by other methods. This depends partly on the fact that the heart-dulness is larger than when percussed in the ordinary position; partly on the fact that the layer of lung over the heart is thinner, so that the difference in sound is more intense. The sense of resistance is also increased. In fact, in many cases the cardiac dulness is first discovered when this method is used, especially in cases with great tympanites. Unfortunately, the condition of the right heart is not much more easily demonstrated by this method than by others. Absolute dulness to the right of the sternum is not very frequently found, so that for the demonstration of hypertrophy of the right ventricle the accentuation of the pulmonary second sound must still be used. In cases with hypertrophy of the left ventricle, such as that in arteriosclerosis, nephritis, etc., the new method gives brilliant results, an increase of four to six cm. in width being not uncommon, and even greater widths being found. Gumprecht has not yet encountered a case in which emphysema prevented the detection of enlargement, both dulness and resistance being very marked and easily recognized. Effusions in the pleura, especially the right, render the method difficult and uncertain.

## Respiratory Neuroses; Spanopnœa and Tachypnœa.

Strubing (*Zeitschrift für klin. Med.*, Bd. xxx. H. 1 and 2) describes some rare respiratory neuroses. In two cases there were attacks of slow and deep breathing. In one case this amounted to orthopnœa, with subjective dyspnœa and feeling of anxiety. Strubing gives this condition the name of spanopnœa. He looks on it as an inhibitory neurosis. In one case the attacks seemed to be due to irritation of the respiratory inhibitory fibres of the superior laryngeal nerve in swallowing. In another it appeared as an asthma from irritation of the trigeminal fibres in chronic rhinitis and hypertrophy of the turbinated.

Tachypnœa also comes on in paroxysms, with increase of the frequency and diminished depth of the respirations. Two cases were seen. In one the attacks ceased after the restoration of a retroflexed uterus. In the other case there were nervousness and mental deficiency.

## The Thoracic Organs in Chlorosis.

F. Müller (*Berliner klin. Wochenschrift*, 1895, No. 38) calls attention to the fact that in chlorosis the diaphragm is abnormally high, so that the percussion is much like that in children. The fact that in chlorosis the cardiac dulness is enlarged has been variously explained. Müller has noticed that in recovery from chlorosis the diaphragm and the heart-dulness return to the normal, the cardiac dulness to the right of the sternum being the first abnormality to disappear. As a hypertrophy of the heart can hardly be supposed to exist in these cases, and as the shape of the heart opposes the idea of dilatation, Müller assumes that the enlarged heart-dulness is due to incomplete expansion of the lungs. This would also explain the high position of the diaphragm.

# OPHTHALMOLOGY.

UNDER THE CHARGE OF

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## Optic Nerve Atrophy in Three Brothers.

F. N. Ogilvie reported at the January meeting of the Ophthalmological Society of the United Kingdom the cases of three brothers, aged twenty-four, twenty-two, and twenty-seven years. In the first the sight was said to have failed in one night, in the second in three months, and in the third in six months. They had all been smokers, but one had given it up more than seven years before. In all of them there was a central scotoma, in two defective color-vision, and in only one were the fields for white contracted. The ophthalmoscopic changes were not well marked. In two of the brothers there was pallor of the disk, but the atrophy was not of very high degree in any of them. Vision was much reduced. One had improved somewhat under strychnine and galvanism. A peculiarity which they shared with other members of their family was tortuosity of the retinal vessels. So far as the family history could be traced there were no other cases of optic atrophy.

## Recurrent Oculomotor Palsy.

G. E. de Schweinitz (Philadelphia) reports (*Trans. of the Amer. Ophthal. Soc.*, vol. vii. page 309) the case of a woman, aged thirty years, who, when one and one-half years old, was violently ill with vomiting, convulsions, right divergent strabismus, and ptosis. At the end of six weeks ptosis and divergence disappeared. From that time she had frequent attacks of neuralgia, mostly associated with divergence of the right eye and closure of the lids; occasionally the ocular symptoms were absent. During childhood these attacks occurred as often as three times a week; later there had not been over five or six in a year. When four years old the divergence became more or less permanent. Two years ago, after an unusually severe attack, ptosis also became permanent. The attacks were preceded by dizziness and full feeling of the head, swelling of the periorbital tissues, and distention of the cutaneous veins. Pain began in the right eye and extended to the occiput, where it settled. Following the onset of pain there was vomiting, lasting from twelve to twenty-four hours. The pupil was oval and absolutely fixed; vision 6/60; the left eye was normal. Treatment by mercury, iodides, and strychnine produced no result.

In a case exhibited by Dr. Ormerod and Mr. Holmes Spicer at the December meeting of the Ophthalmological Society of the United Kingdom, the boy, then aged fifteen years, was first attacked when one year old, but the second attack did not occur until the age of seven, since which time an attack came every nine or ten months. The left eye was affected, and an intense headache occurred on that side. There were slight ptosis, dilated pupil, and complete paralysis of the external muscles supplied by the third nerve.

### SUPERNUMERARY CARUNCLE.

SIDNEY STEPHENSON (London) reports (*Ophthal. Review,* No. 171) this condition occurring in a girl, aged eleven years. It presented on the right lower lid as a small reddish growth, oval, about as large as a hemp-seed, with a granular surface, lying behind the inferior canaliculus; but was not connected with the caruncle. No change was observed in it during six months she was under observation. It was then snipped away; and, examined microscopically, was found to consist of epidermic and dermic tissue, the latter containing hair follicles, sebaceous glands, and muscular fibres. He had been unable to find any case previously reported.

### EYE-LESIONS IN MYXŒDEMA.

P. A. CALLAN (New York), discussing the ocular conditions presented by patients with this disease, states (*Trans. of the Amer. Ophthal. Soc.*, vol. vii. page 391) that the prominent symptoms are lacrymation, due to the swelling of the lids, and an appreciable amount of corneal anæsthesia.

Referring to the statement of Hamilton, "that the fundus oculi presents a peculiar tumefied appearance and choked disk is occasionally found," he says that in four cases repeatedly observed there were no such lesions. One of his patients, after treatment for two years with thyroid extract, had developed a typical albuminuric retinitis.

### DETACHMENT OF THE RETINA.

R. B. DUNCAN (Melbourne) concludes, with reference to retinal detachment (*Australian Medical Journal*, vol. xvii. No. 12), that it is impossible for it to occur in a perfectly healthy eye. Disease of the retina itself, as a rule, precedes any detachment. Vitreous changes in the form of fibrillary alterations, with or without retraction, are invariably present, and are generally antecedent to the retinal changes and detachment. In idiopathic cases the retraction of the vitreous is the primary cause of the retinal detachment. In traumatic cases, while the retinal detachment may suddenly occur, it is only possible when some anterior changes have occurred in the vitreous. Retinal ruptures are common to the great majority of retinal detachments.

### TREATMENT OF ULCERS OF THE CORNEA.

E. W. WOOD WHITE, in the Middlemore lecture (*Birmingham Medical Review*, vol. xxix. No. 1), deals chiefly with the treatment of ulcers of the cornea. He thinks the protective bandage should generally be adopted to prevent irritation of the surface; but that it is contraindicated where there is considerable conjunctival discharge and irritation, in sloughing ulcers secondary to lacrymal disease, and in young children. After corneal perforation he would use the pressure-bandage. Mydriatics are of great assistance in a large proportion of cases. For painful superficial ulcers he prefers the mydriatic dissolved in vaseline or castor oil, rather than water. Of drugs of this class he has found the hydrochlorate of scopolamin most satisfactory.

If the ulcer is extending, more active treatment is necessary. For this, he says, "the galvano-cautery has been universally used with splendid results." It is not necessary to cauterize the whole ulcer, but the advancing margin must be thoroughly destroyed. After cauterization he fills the ulcer with finely powdered iodoform or iodol. Scraping the ulcer, the dropping upon it of water heated to 150° and daily applications of carbolic acid, formalin, or a saturated solution of mercuric chloride, are mentioned. He believes that only in rare instances is eserine the best drug to use, and that it had better be avoided by those whose experience is not large. For rapidly spreading ulcers with hypopyon, paracentesis of the cornea, with or without the entire removal of pus from the anterior chamber, or the Saemisch incision, may be resorted to.

Regarding subconjunctival injections, he finds weak solutions of mercuric chloride, 1 to 4000, less painful than strong solutions and equally effective, but that probably the best agent for this use is a 4 per cent. solution of common salt.

The branching ulcer of so-called dendriform keratitis generally requires touching with the cautery or scraping. The absorption or faceted ulcer demands tonics and nourishing food; so does keratomalacia.

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### NON-EXISTENCE OF A SEPARATE CORTICAL COLOR-CENTRE.

WARD A. HOLDEN (New York) (*Archives of Ophthalmology*, vol. xxiv. No. 4) opposes the view that color-perception is connected with a cortical centre distinct from that for the perception of form, by a series of observations made on cases of hemichromatopsia. He had one-centimetre squares of pale green, saturated red, and saturated blue placed on gray,cards having the same light-intensity as the colors. Three gray patches were then prepared on a white ground having such intensity that each gray patch was seen throughout as large a field as one of the color-squares. He also had three black dots of different sizes on a white ground, each of which had a normal field also corresponding to one of the color-squares. In the normal eye the black dot, gray patch, and corresponding color were seen over equal fields; and the same relation was found to hold good in most cases of amblyopia.

In three cases of hemianopsia for colors it was found that where the colors were not seen, neither the corresponding dots nor the gray patches could be recognized. He therefore concludes that the slight interference with conduction of any of the fibres of the visual tract leads to inability to recognize green, or even red, or to distinguish slight differences in luminous intensity; that a greater interference with conduction prevents the distinguishing of white from black; that the recognition of color varies with the light-sense; and, therefore, the assumption of the involvement of a particular cortical centre in cases of hemichromatopsia is unnecessary and erroneous.

# DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

UNDER THE CHARGE OF

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## Stricture of the Larynx.

At a recent meeting of the Hungarian Society of Otologists and Laryngologists (*Revue Hebd. de Laryngologie, d'Otologie et de Rhinologie*, 1896, No. 4) Dr. V. Navratil described three cases of stenosis of the larynx. The first case had followed tracheotomy for dyspnœa attending acute laryngitis. The second had followed an attempt at suicide, and was due to bilateral cicatricial anchylosis of the cricoid arytenoid joints. The third case is the interesting one of the series, and seems to have been an instance of scleroma. A journalist, forty-eight years of age, had for a long time suffered with dryness of the throat, and continual cough with inability to expectorate. Serious dyspœna had rendered tracheotomy necessary. As the respiration by the mouth could not be re-established, the case was referred to Navratil, who detected a subglottic bilateral hypertrophy of the vocal bands. All other treatments having failed, laryngotomy was performed for the purpose of excising the tumor, but the growth resisted both the knife and the scissors ; hence it had to be burned away with electric cautery, and in consequence it had been impossible to preserve any portion for microscopic examination. The hypertrophic neoplasm was so incorporated with the vocal band on the right side that it was necessary to destroy in part that structure also. Consequently a portion of the right vocal band penetrated into the glottis in the form of a flap. The glottis regained its normal proportions and the patient respires comfortably on closing the orifice of the canula. The canula will be removed after the ablation of the flap, when the patient will leave the hospital completely cured.

This case gave rise to considerable discussion, in the course of which Dr. Morelli stated that he had observed analogous cases in which the secretions produced by chronic catarrh had become accumulated and fixed into the trachea. In one case, indeed, it had been necessary to practise tracheotomy, and after the removal of the canula a second tracheotomy had become necessary. This patient had a stenosis of the nose so great that a No. 3 bougie could hardly pass ; the vocal bands were thick, and a great quantity of thick mucus accumulated in the trachea. Despite successful dilatation the exudation accumulated to such an extent that the removal of the canula was impossible. The patient finally became tuberculous and died.

The same gentleman had as a patient a young woman, whose nose, pharynx, and larynx, as far as the trachea, had become covered with a thick colloid mucus as hard as a stone. The patient being almost near her end, tracheotomy could not be performed in consequence of the local conditions. These cases, he contends, demonstrate that dry rhinitis and pharyngitis are not so infrequent maladies as is often believed.

Dr. Newmann cited two cases of subglottic hypertrophy in which there were thick folds beneath the vocal bands, the pathological nature of which could not be determined, as the patients had quit the hospital after being relieved by tracheotomy.

He had also observed in a child of twelve years a subglottic stenosis, conical in form, and produced in sequence to conjunctive hyperplasia of such a character that tracheotomy had to be performed. He had also observed, five years ago, a case similar to that of Navratil's, in which the stenosis extended as far as the bifurcation—this in sequence to primary scleroma of the nose and larynx.

### Operative Treatment of Multiple Papillomas of the Larynx.

Papers on this subject were read by Dr. Navratil and Dr. Neumann at the late meeting of the Hungarian Society of Otologists and Laryngologists (*Revue Hebd. de Laryngologie, d'Otologie et de Rhinologie*, 1896, No. 4).

Navratil contends that while endolaryngeal extirpation usually succeeds in simple papilloma, whether in the adult or in the infant, the result is different in multiple papillomas when they obstruct the calibre of the larynx and give rise to dyspnœa. Here it is necessary to practise prophylactic tracheotomy first, and then to undertake the extirpation of the papilloma; in which he proceeds differently in the infant from what he does in the adult. In the infant he used to perform laryngotomy and endeavor to remove the papillomas along with the subjacent mucous membrane. Many cases had been operated upon in this way, but recurrences had taken place, though less rapidly than after the endolaryngeal method. He attributes these recurrences to the limited field, which does not permit precision in operation. Of late he has performed his tracheotomy and then extirpated the papillomas in several sittings, partly through the mouth and partly through the wound; and for two or three years he has had no recurrences in these cases.

In the adult, where the conditions and space are more favorable, he performs laryngotomy immediately after tracheotomy, and extirpates the papillomas with their base. In this way he has avoided recurrences. He concludes by stating that while he has observed no untoward results after repeated endolaryngeal operations in infants, he has three or four times seen the consecutive formation of epithelioma in adults.

Dr. Neumann, after calling attention to the great tendency to recurrence of papilloma in infants (so great that a half-pint bottle might have been filled with the growths removed from one infant in four years), states that cure seems to depend less upon radical operation than upon extinguishment of the power of reproduction, which, unfortunately, does not cease for years. He mentions an interesting case in which the papillomas disappeared of themselves, probably by spontaneous absorption, and he believes this observation to be a unique one. But, although the occurrence is rare, it has been reported before. An infant, six years of age, about whom he was consulted in the winter of 1892, had been hoarse for two years and completely aphonic for several months. Both vocal bands were covered with papillomas. These were removed in the course of three weeks at different sittings; but although the larynx was cleared out, the irritated borders of the vocal bands would not permit loud phonation. Two or three weeks afterward the patient recommenced to respire with difficulty, the separation of the vocal bands having become insufficient. The vocal bands became inflamed, and there were two or three recurrences of these conditions. The stenosis augmenting, the patient was sent to the hospital for purposes of intubation. Intubation suppressed the dyspnœa, and the respiration remained free for a couple of hours after the removal of the tube. The recurrences increased, and it was feared that portions had been forced by intubation into the trachea, as the papillomas covered not only the vocal bands, but the free border of the epiglottis also. Toward the end of February, 1893, DR. KOVACS performed tracheotomy, which relieved the dyspnœa. The papillomas now appeared to diminish in volume. When Dr. Neumann examined the patient in the autumn he was astounded that the vegetations on the epiglottis had become completely reabsorbed, while only one papilloma was to be seen in the anterior wall of the larynx. This also gradually disappeared of itself, and certainly was not expelled by cough.

## NASAL TUBERCULOMA.

DR POLYAK reports (*Revue Hebd. de Laryngologie, d'Otologie et de Rhinologie*, 1896, No. 4) a case in a man, forty-nine years of age, who had complained of hemorrhage and obstruction in the right nostril of six months' duration, and subsequent hemorrhage and formation in the left nostril. The right nostril was completely filled by an irregular tumor resembling granulations, which bled easily. On the left side of the anterior portion of the septum was a tissue partly covered with dried crusts of a dull white, of the dimensions of a thaler-piece, flattened, granulous here and there, but not prominent, and bleeding easily. The tumor on the right side was at once removed with the incandescent snare, when it was found that the base of the neoplasm had occupied the right side of the septum at a point corresponding with the lesions described upon the left side. Slight hemorrhage, consecutive to the operation, was arrested immediately by an insufflation of dermatol. The tumor removed was thirty millimetres in length and forty millimetres in breadth, and had erosions upon the external surface where it was covered with granulations. It contained many tubercles and very few bacilli. There was no tuberculosis of the lungs or other portion of the body.

Subsequent history of the case is unknown.

## SUPPURATION OF THE MAXILLARY SINUSES CONSECUTIVE TO DEFLECTION OF THE NASAL SEPTUM.

In the *Revue Internationale de Rhinologie, Otologie, et Laryngologie*, 1896, No. 3, DR. AUGIERAS, of Laval, details a case of suppuration of the right antrum of Highmore in a man forty years of age, the septum of the nose being strongly deflected to the left side. This inflammation of the maxillary sinus, after existing for many years, had given rise to alveolo-dental periostitis.

# OBSTETRICS.

UNDER THE CHARGE OF

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## The Removal of Old Ectopic Gestations.

Von Herff (*Zeitschrift für Geburtshülfe*, Band xxxiv. Heft 1) concludes from his study of these cases that in removing ectopic gestation-sacs which are complicated by adhesions it is important whenever possible to ligate the uterine and spermatic arteries. An attempt should then be made to shell out the sac, beginning at the periphery of the placenta, using clamps and ligatures to control bleeding. The aperture left should be tamponed with gauze. In rare cases the site of placental attachment must be compressed by a running stitch; compression of the aorta must be employed or removal of the uterus, with application of clamps to the bleeding vessels. Gauze packing is especially valuable where oozing exists or secondary bleeding is found.

## A Study of Fœtal Excretion.

In the *Zeitschrift für Geburtshülfe*, Band xxxiv. Heft 1, Rensing reports experiments on forty-two pregnant and parturient patients to determine the excretion by the fœtus of material introduced into the mother's body. He gave methyl-blue in capsules to the mothers, in amounts of fifteen grains daily. The drug was given until two months before labor. From half to one hour after giving this to the mother traces could be detected in the urine. When a mother was given methyl-blue half an hour before labor the urine of the fœtus showed its presence. This substance does not enter the mother's milk, as do potassium iodide and salicylates. About eight days seemed to be required to remove the methyl-blue wholly from the fœtal body, although it disappeared much more rapidly from the mother. It was found that the excretion of methyl-blue increased steadily for the first three days after birth. This corresponds with what has been observed regarding the discharge of uric acid in the newborn.

## Pregnancy and Labor Complicated by Cancer of the Cervix.

In the *Zeitschrift für Geburtshülfe*, Band xxxiv. Heft 1, Beckmann reports two cases of pregnancy and labor complicated by cancer of the cervix.

The first was a multipara, aged forty-seven years, who was seen in the first months of her seventh pregnancy. A sero-sanguinolent discharge was present. Malignant disease had destroyed the posterior lip of the cervix and invaded the vagina on the right. The uterus was removed by the vagina, the patient making a good recovery. Six weeks after the operation she was in a good condition.

In connection with this case Beckmann calls attention to the fact that cancer does not predispose to sterility nor does it tend to interrupt pregnancy; on the contrary, gestation is often prolonged. Abundant evidence shows the utter worthlessness of delay and palliative treatment; vaginal extirpation of the affected uterus is the treatment indicated.

His second case was admitted to the hospital in the ninth month of her sixth pregnancy; the cervix was infiltrated with carcinoma on the left side. Spontaneous labor occurred, with a living child. The puerperal period was normal. Fifteen days after labor the uterus was removed through the vagina, the carcinomatous tissue having been first thoroughly seared. The patient made a good recovery.

In studying the literature of the subject Beckmann concludes that in cases in which the entire uterus cannot be safely removed that delivery by abdominal section offers a far better chance for the mother and child than does spontaneous birth.

### Treatment of Face-presentation by Manipulation.

In the *Archiv für Gynäkologie*, Band li. Heft 2, Jungmann reports three cases of face-presentation in which he succeeded in changing the presentation to an occipital one by a combined manipulation ascribed in various portions to Baudelocque, Schatz, and Thorn.

The patient is anæsthetized by chloroform and the shoulder of the child raised and its back moved obliquely in the direction best fitted to promote descent of the occiput by the external hand. The internal hand meanwhile raises the chin and brings down the occiput, maintaining it in the desired position until the patient wakes from the anæsthetic and pains begin. When the occiput has engaged and flexion is secured the case is allowed to proceed spontaneously.

Jungmann concludes that in cases seen before active labor has begun that Schatz's manipulation of raising the fœtal body by external manipulation and procuring flexion instead of extension should be employed. When dilatation has begun and the chin is posterior, combined manipulation should be employed when two or three fingers can be inserted through the os and cervix; when the pelvis is normal or very little contracted; and when the fœtus is movable. Anæsthesia is usually required for this manipulation. Any condition of danger demanding prompt and rapid delivery is a contraindication for the use of this method.

### Albuminuria and Eclampsia.

Saft (*Archiv für Gynäkologie*, Band li. Heft 2) reviews current knowledge on this subject and adds his own studies. He declares, with those who have most thoroughly studied the subject, that while the relation between albuminuria and eclampsia is intimate, that it is not invariably causal; the direction of our study should lie in searching to identify the causal agent present.

Saft found albuminuria in 54.1 per cent. of pregnant women, usually in the second half of pregnancy, most often near the close. The greatest amount of albumin is often found several weeks before the end of pregnancy, occurring more often in primigravidæ than in multigravidæ, and so continuing during labor, when the quantity of albumin is much greater. While albumin usually disappears from the urine during the first few days after labor, it persists longer in primigravidæ than in multigravidæ; kidney-lesions are more serious and persistent in primigravidæ than multigravidæ.

Blood-corpuscles without albumin in the urine of pregnant women come from the bladder, casts accompanying albumin. Casts and albumin do not stand in close relation to each other, nor do the amounts of albumin and casts maintain a corresponding ratio. Twin pregnancy, hydramnios, and contracted pelvis favor albuminuria in pregnancy, especially in primigravidæ. In multigravidæ these complications cause albuminuria during labor. Abortion often occurs in albuminuric patients.

Saft believes the pathology of eclampsia to be as follows: The organism becomes partially intoxicated by products of metabolism. During labor great muscular activity increases this condition. The elimination of these toxins produces a partial degeneration of the kidneys, from which healthy women speedily recover. Corresponding changes occur in other organs of elimination. When heart-lesions are present or acute nephritis occurs the prognosis is most grave. Patients in good condition previous to pregnancy usually recover completely.

### Ten Operations for Ectopic Gestation.

Harrison Cripps (*British Medical Journal*, 1896, No. 1839) reports ten cases of ectopic gestation, in all but one of which a successful result followed operation. In one case, upon opening the abdomen and removing a large quantity of blood, it was found that the Fallopian tube had ruptured, and that a blood-clot was protruding through an aperture of considerable size. The ovary and tube were removed, the abdominal cavity flushed, but not drained.

The second case was that of a woman who had borne two children, and who had almost constant pain, with vaginal hemorrhage, for some time. The contents of the abdomen and pelvis were found matted together. A cavity was found containing a blood-clot as large as the fœtal head, while a second cavity contained a smaller quantity of blood. The ovaries and tubes were removed, and the abdomen flushed and drained for a few days with a successful result.

In another case, in which pain and hemorrhage had gone on for some time with previous sterility, a cyst was found upon the opening of the abdomen. The cyst was removed, and the cavity flushed and drained.

In another interesting case a ruptured cyst was discovered in Douglas's cul-de-sac, and the effort was made to separate it and draw it up; this caused hemorrhage, however, so severe that the sac was ligated and removed. Several other cases of the series presented very similar conditions.

His tenth case was in a multigravida, in whom a tumor was found behind the uterus, apparently between the folds of the broad ligament; this presented the appearance of the gravid uterus, and was found to contain a living fœtus. The placenta was firmly adherent to the wall of the sac. An effort was made to stitch the sac to the abdominal incision, but it was situated so deeply that the result was not satisfactory. The abdomen was closed without drainage. Death ensued three days later. On post-mortem examination it was found that the placenta, which had been left, was soft and friable, and beginning to decompose.

# GYNECOLOGY.

UNDER THE CHARGE OF

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## Shortening of the Sacro-uterine Ligaments for Retroversion.

Gottschalk (*Centralblatt für Gynäkologie*, 1896, No. 16) believes that since relaxation of the sacro-uterine ligaments and loss of normal fixation of the cervix are the principal causes of movable retroflexion (as pointed out by Schultz), especially after labor, shortening of the ligaments is the most rational way of effecting a cure. His technique is as follows: The uterus is first replaced, if movable. A median vertical section is then made through the posterior vaginal fornix, which begins half an inch behind the portio and extends downward to the extent of two inches. Douglas's pouch is opened; the edges of the vaginal and peritoneal incisions are united with temporary sutures, which always serve to keep the wound open. If the uterus is fixed, the adhesions are separated and the uterus is replaced. The operator then fixes the left sacro-uterine ligament with the tip of the left forefinger at a point as far as possible from its cervical insertion (one to two inches), while an assistant strongly everts the edges of the wound by making traction outward on the temporary ligatures. Guarded by the finger, and under direct control of the eye, an aneurism-needle carrying a stout silk suture is passed from above downward through the middle of the ligament, and the suture is tied. The other end of the suture is threaded on a sharp needle, which is entered in the posterior wall of the cervix just below the level of the os internum, and being carried deeply emerges in the portio at a point near the edge of the vaginal wound. Both ends are tied so that the knot lies in the vaginal fornix. The same procedure is adopted on the opposite side, a small strip of gauze is introduced into Douglas's pouch, and the wound is allowed to close by granulation. If the uterus has in the meantime fallen backward, it is again replaced, and is kept in position by a firm vaginal tampon. The patient is kept on the side or stomach, but is allowed to leave her bed on the seventh day, when the tampons are removed and replaced by another in the anterior fornix, which is left *in situ* for three days. The sutures are not removed. The writer has performed two operations by this method, with perfect results, the uterus remaining in a normal position, but with free mobility. There were no unpleasant symptoms. Both patients had been treated with pessaries for several years.

## Hysterectomy with the Cautery.

Kümmell (*Centralblatt für Gynäkologie*, 1896, No. 16) refers to the fact that the statistics of total extirpation for cancer during the last sixteen year show that only 7 per cent. of the patients operated upon are radically cured. He believes that if the glands are already involved the radical operation is useless, and that it is impossible to avoid metastases. Recurrences are due to the fact that either all the diseased tissue has not been removed, or the surrounded surface was infected during the operation.

That such infection does occur has been amply proved in numerous reported cases as well as by experiments. Different plans have been suggested for avoiding this. Winter advises against preliminary curettage of the cancerous tissue, and sutures the cervix in cases of carcinoma of the corporeal endometrium. Hahn suggests constant irrigation with sublimate solutions throughout the operation. The writer believes that infection can be prevented by the use of the galvano-caustic knife, which he uses to separate the broad ligaments and open the anterior and posterior culs-de-sac. He also uses clamps.

## ANTERIOR COLPORRHAPHY IN PROLAPSUS UTERI.

NIEBERGALL (*Inaugural Dissertation*, abstract in *Centralblatt für Gynäkologie*, 1896, No. 16) reports the results of operations for prolapsus at the Basle clinic during seven years. Fifty cases were treated by simple anterior colporrhaphy and sixty by double anterior colporrhaphy, the cervix being previously amputated in nearly every instance. Seventy patients were kept under subsequent observation. Twenty-nine out of thirty-four in the latter class were cured; in the former twenty-eight out of thirty-six were cured, the total percentage of cures being 81.5 per cent. Posterior colporrhaphy was always performed two weeks after the first operation, silver-wire sutures being used. Considerable stress is laid upon the importance of allowing an interval of time to elapse between the two operations.

## VAGINAL FIXATION.

JOHANNOVSKY (*Wiener klin. Wochenschrift*, 1896, Nos. 6-10) has performed thirty operations, no patient having become pregnant. One case resulted fatally from sepsis, but in all the others the uterus was subsequently found to be in normal position, though the symptoms were not always relieved. The operation is not applicable to cases in which the retroflexed uterus is firmly fixed by adhesions to the posterior and lateral walls of the pelvis. In operations on the adnexa he recommends dividing perimetric adhesions with the Paquelin cautery, as suggested by Dührssen and Küstner. Omental and intestinal adhesions do not constitute a contraindication.

The disadvantages of the vaginal operation are the frequent technical difficulty and the great care necessary to secure absolute asepsis; so that it cannot be regarded as a substitute for abdominal section.

On account of the serious results which have followed pregnancy and labor after vagino-fixation of the uterus, the writer advises against its performance in the case of young women.

## DIAGNOSTIC CURETTAGE.

GESSNER (*Ibid.*) believes that the value of curettage for diagnostic purposes is not yet sufficiently appreciated in spite of the advance in microscopical technique. Even in Germany palpation of the uterine cavity is still regarded as the best method of examining the uterine cavity in cases of suspected malignant disease. Preliminary dilatation of the cervix sufficient to admit the examining finger, whether rapid or gradual, is not free from danger; in fact, fatal cases have been reported. On the other hand, curettage is safer, even with the possible attendant risks of perforation and infection. Narcosis is unnecessary, and the diagnosis is made at a single sitting.

Under some circumstances (in the case of a narrow, senile vagina, a long, rigid cervix, or a uterus enlarged by fibroid) intrauterine palpation may be impossible. The finger cannot always distinguish malignant from non-malignant growths. Here the removal of fragments with the curette furnishes positive information.

During the past five years the diagnosis of malignant disease of the corporeal endometrium has been made at the Berlin clinic in forty-one cases, and the uterus extirpated, direct palpation having been entirely discarded.

Diagnostic curettage is best performed under ether, the cervix being previously dilated. The entire surface of the uterine cavity should be scraped, the fragments removed being hardened in alcohol and examined microscopically.

## TREATMENT OF PRURITUS VULVÆ.

In a recent discussion on this subject before the Berlin Obstetrical Society (*Centralblatt für Gynäkologie*, 1896, No. 18) RUGE stated that pruritus was nearly always due to some local cause, and that he seldom failed to cure it by thorough cleaning of the external and internal genitals.

Martin agreed with this statement, but also recommended shaving the external genitals and applying flower of sulphur. Flaischler uses solutions of sulphur varying in strength from 20 to 50 per cent. Glockner employs 1 per cent. solution of sulphate of zinc and 10 per cent. aristol ointment. Gottschalk recommends 10 per cent. thymol ointment, with or without cocaine. Olshausen thought that diabetes was the cause of obstinate pruritus in the majority of the cases, though in some it was a neurosis which resisted all treatment. Bodenstein uses a strong solution of nitrate of silver (40 per cent.), though he had cured the affection with a 1 per cent. solution.

## CANCER AND TUBERCULOSIS OF THE UTERUS.

NASSANER (*Centralblatt für Gynäkologie*, 1896, No. 18) reports a rare case of epithelioma of the cervix uteri, in which an examination of the extirpated organ showed several tuberculous nodules, the size of cherries, situated in the corporeal endometrium, the lowest being an inch above the upper limit of the malignant disease. These nodules were supposed to be cancerous until they were examined microscopically, when they were found to contain numerous giant cells and tubercle bacilli. The apparently healthy endometrium was also the seat of beginning tuberculous disease.

Since the cancerous affection was upward of four months' standing and the tubercles were evidently of recent origin, the writer inferred that the latter developed subsequently and were the primary seat of infection. There was no evidence of tuberculosis elsewhere in the body.

# PÆDIATRICS.

UNDER THE CHARGE OF
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ASSISTED BY
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## THE INCREASE IN WEIGHT OF PREMATURE INFANTS.

POTEL devotes his thesis (Paris, 1895) to this interesting subject, founding it upon a study of 173 infants born at periods from six and one-half to eight months of intrauterine life, who survived the dangerous period and were discharged from the maternity after a sojourn of an average of eighty-two days for the six and one-half months children and of twenty-eight days for those of eight months. Of 56 infants born at six and one-half months, 11 survived—a survival of 19.6 per cent., or a mortality of 80.4 per cent. The average increase in weight per day for one of these children was 9.4 gm. Of 131 infants born at seven months the survival was 41.9 per cent. ; the mean daily increase of weight was 11.5 gm. Of 53 infants born at seven and one-half months the survival was 69 per cent. and the increase of weight 13.8 gm. Of 110 infants born at eight months 64.5 per cent. survived and the daily increase averaged 22.8 gm. The average weights at birth were as follows : At six and one-half months, 1408 gm. ; at seven months, 1700 gm. ; at seven and one-half months, 1900 gm. ; and at eight months, 2150 gm. The loss of weight of the first three days in the premature is not more marked than in infants at term, but its consequences are more grave, since the recovery of the initial weight takes longer ; it is also during this period of loss or stationary weight that the mortality is highest, those infants exempt from hereditary taint being the most resistant.

The increase in weight, as shown by the figures quoted, is longer deferred and slower as the infant is more premature. Thus, with an infant of six and one-half months the increase often does not commence till after the second week.

The proportion of infants saved is a tribute to the modern methods of dealing with these unfortunate cases.

## A CASE OF TUBERCULOSIS OF THE INTESTINE BY INGESTION.

MARFAN and APERT (*Revue Mensuelle des Maladies de l'Enfance*, June, 1896, p. 273) record an interesting example of a form of tuberculous disease which is rare under the age of two years. The child, aged sixteen months, had been nourished only at the breast, with the exception of certain days, when the mother being at work, cow's milk had been given. The family history showed healed tuberculous cervical adenitis in the mother ; one of her nine other children had died of tuberculous peritonitis and another had coxalgia.

At the age of nine months the patient had come under treatment for a suppurative adenitis of the neck, and at this time it was noticed that there were ulcerations upon the gums, covered by pultaceous and fetid exudate, which persisted despite treatment instituted at the time. At the age of thirteen months a diarrhœa began and persisted without amelioration till death, a few days after admission to the hospital. The autopsy revealed an enormous mass of tuberculous mesenteric glands, with tuberculous ulcerations of the colon, ileum, jejunum, and duodenum; liver, spleen, heart, and kidneys normal; a few small, recent grayish granulations in the lungs, with two small foci of broncho-pneumonia in the right base.

According to the authors, the first focus of disease was the mouth and the ganglia of the neck; next the intestine. The slight pulmonary lesions were of recent origin. The source of the infection may have been the milk of the mother or of the cow, or through the medium of soiled objects put in the mouth. Inoculation-experiments to clear up this point were not possible at the time.

Tuberculosis of the intestine is exceptional in the first two years of life, as shown by the statistics of Wiederhofer, who, in 101 cases of intestinal tuberculosis in childhood, found only six under two years of age and a percentage of eight for all cases of tuberculosis under two years, as opposed to 28 per cent. for cases in children from two to fifteen years of age. Three sources of origin for intestinal tuberculosis are possible: 1. In acute miliary tuberculosis small, gray, semi-transparent granulations may be found upon the intestinal mucous membrane. These are hæmatogenous in origin. 2. In young children with chronic pulmonary tuberculosis with cavities the intestine may be infected from the swallowed expectoration; the lesion then assumes the common ulcerous form seen in adult consumptives; it is extremely rare under two years. 3. After the ingestion of tuberculous food, especially the milk of a tuberculous cow. In these cases there may be no lesion of the intestinal mucous membrane, the bacillus having traversed it to find a suitable soil for growth in the mesenteric glands. When lesion of the mucous membrane occurs it ordinarily assumes a special form—discrete without ulceration. This is characterized by scattered submucous nodules, the size of a pea, filled with gray or cheesy, more or less softened material, and limited by a delicate fibrous covering, these nodules corresponding in position with the affected mesenteric gland.

## PRIMARY SARCOMA OF THE VAGINA IN CHILDREN.

D'ARCY POWER (*St. Bartholomew's Hospital Reports*, 1896, vol. xxxi.) records a case under this title occurring in a girl of two years and four months, and quotes abstracts of twenty-four other cases collected in a rather hasty examination of the literature. From a consideration of these cases he concludes that primary sarcoma of the vagina is only a specialized form of malignant disease which may affect any or all of those connective tissues which are involved in the complicated developmental processes associated with the formation of the cloaca. The sarcoma grows in the connective tissue of the pelvic organs, and extends into the bladder, the urethra, the uterus, or the vagina. It is either well circumscribed, as in the case described, or is diffuse, as in a case reported by AHLFELD (*Archiv f. Gynäkol.*, Bd. xvi. p. 135), but whether circumscribed or diffuse, whether affecting the vagina alone or infiltrating all the neighboring organs, this form of sarcoma shows an almost constant tendency to become polypoid and multiple.

As it occurs in children, primary sarcoma does not, in the majority of cases, run a very rapid course. It does not ulcerate very readily. It does not usually affect the lymphatic glands. It does not disseminate, but its prognosis is very grave. It recurs quickly after removal, and it kills by interfering with the action of the pelvic organs, by retention of urine more often than by obstruction of the bowels. The diagnosis is easy, but the polypi are often looked upon as innocent growths, and their true nature remains unrecognized until the presence of a tumor in the pelvis shows that it is too late for surgical interference. Multiple polypi of the rectum and of the genito-urinary tract in young people, however, are so rare, and, when they do occur, are so often associated with malignant disease, that their presence should always lead to a suspicion of such a condition. The complete cure which has been effected in one or two cases of primary sarcoma of the vagina in children shows that the early and complete removal of the growth may be effectual in this as in other forms of malignant disease.

### BACTERIOLOGY OF THE VAGINA OF THE NEWBORN.

VAHLE (*Zeitschrift f. Geburtsh. u. Gynäkol.*, vol. xxxii. No. 3) has examined cultures from the vaginas of 75 newborn girl-babies shortly after birth. In the first twelve hours the vaginal secretions were always sterile. From this time to the third day the results showed a decreasing number in which sterile secretions could be found, until finally at the end of three days micro-organisms were found in all cases. Pathogenic bacteria were quite often encountered, the streptococcus being found in 14.6 per cent. of the cases.

### BACTERIOLOGY OF THE ANGINAS OF SCARLATINA.

LEMOINE (*Société Médicale des Hôpitaux*, December 20, 1895) has analyzed 100 cases of scarlatinal angina observed at the beginning of the infection. Cultures were made from the deep tissue of the tonsils after searing the surface by the actual cautery. In all the cases he found the streptococcus, ninety-three times in pure culture, seven times associated, fifteen times with the bacillus of Loeffler, twice with the colon-bacillus. Clinically it is interesting to note that these two associations produce the same symptomatology. The author thinks that there is here only one variety of streptococcus, but that the virulence of this microbe varies with its soil, whether found in the mucus, false membrane, or tissue of the tonsil.

### A VARIETY OF STREPTOCOCCUS REFRACTORY TO MARMOREK'S SERUM.

MÉRY (*Soc. de Biologie*, April 18, 1896) states that he has isolated from a case of scarlatina a streptococcus without any morphological or cultural peculiarity to distinguish it from other streptococci, but showing the remarkable property of causing purulent arthritis and death in injected rabbits despite the previous or contemporaneous inoculation with Marmorek's serum.

# PATHOLOGY AND BACTERIOLOGY.

UNDER THE CHARGE OF

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## Identification of the Spirillum of Asiatic Cholera.

In the course of an exhaustive study of the cholera vibrio, more particularly as regards the artificial induction of immunity to its inoculation in animals, R. Pfeiffer discovered the interesting fact that when mixed with the serum of immunized guinea-pigs, and inoculated into the peritoneal cavity of susceptible animals, virulent cultures of the spirilla in large dose remained innocuous, and that on subsequent examination of the peritoneal contents the bacteria could be seen to have undergone disintegration to a greater or less extent, dependent upon the relative immunizing strength of the serum of the immunized animal. This power of destroying the cholera spirilla is believed by Pfeiffer to depend upon the presence in the serum of certain antagonistic substances ("Antikörper") which have a distinct inhibiting influence upon the vital processes of the bacteria. As a result of this discovery Pfeiffer (*Zeitschrift f. Hygiene und Infectionskrankheiten*, 1895, xix. p. 75) has suggested a test of the identity of the cholera spirillum, for his investigations show that no other species of bacteria is affected in the same way by mixing with the serum. It will be remembered that a similar test was alluded to in connection with the identification of the typhoid bacillus (*Cf.* American Journal of the Medical Sciences, May, 1896, p. 624).

The method suggested by Pfeiffer is as follows: A loopful of the culture to be tested is mixed with a cubic centimetre of bouillon, to which ten times the amount of serum necessary to protect a guinea-pig of 200 grammes weight from a similar dose of virulent cholera spirilla has been added, and the whole is at once inoculated into the peritoneal cavity of a young guinea-pig of from 200 to 300 grammes weight. In the inoculation care should be taken to avoid injury of the intestines, and the cultures employed should be recent and should have been shown to consist of well-formed and actively moving germs.

As control, a similar quantity of the same culture is mixed with a cubic centimetre of bouillon as before, an amount of ordinary guinea-pig serum equal to the amount of immunizing serum made use of in the original test is added, and the whole is inoculated into another guinea-pig.

In twenty minutes some of the peritoneal contents in each case is withdrawn by means of glass pipettes, and is examined. If the bacteria are the specific germs of cholera they present a very different appearance in the two cases. Those obtained from the control-animal are well formed, active, and seem to have multiplied. Those which were exposed to the action of the immunizing serum are small, misshapen, immobile for the most part, apparently dead. Pfeiffer maintains that unless a distinct difference is observable between the bacteria in the two experiments the micro-organism under examination must be regarded as probably *not* the cholera vibrio, since the change described is very constant in the case of the cholera germ, and has not been observed to occur with any other under similar conditions. Pfeiffer accordingly presents this as a specific differential test for the cholera bacillus.

Since the publication of the above test a simpler modification of it, not requiring the inoculation of animals, has been suggested by Pfeiffer and Vagedes (*Centralblatt f. Bakteriologie,* etc., 1896, xix. No. 11, 385), and has been found to be of great use in distinguishing the pathogenic species from other closely allied forms.

In the course of experiments directed to the explanation of the disintegration of the bacteria which occurs when they are mixed with immunizing serum and inoculated, it was discovered by Pfeiffer that the bacilli did not undergo disintegration when they were exposed to the action of the serum in a test-tube only. In this case the activity of the germs was inhibited, and they collected at the bottom of the test-tube in flocculi, but their shape remained unaltered. It was further noted that after a variable time in the incubator the flocculi began to break up, microscopic examination showing that the germs were recovering their mobility and were gradually returning to their normal condition. From this Pfeiffer inferred that the effect of the immunizing serum is to inhibit temporarily the activity of the germs, but that without the body-juices it is incapable of destroying them.

The test evolved from these observations depends upon the fact that no other germ than the cholera-bacillus is similarly inhibited in its activity by the specific immunizing serum. As suggested by Pfeiffer and Vagedes, it is carried out in the " hanging drop." The serum employed by them had an immunizing power such that one-fifteenth milligramme was capable of protecting a 200-gramme guinea-pig against a dose of 2 milligrammes of virulent cholera-culture. This serum was diluted with fifty times its quantity of bouillon, and hanging drops of it were inoculated with the culture to be tested. The microscope showed the gradual inhibition of the activity of the cholera-bacilli, resulting in the complete inactivity of all present after twenty minutes. The cultures were then placed in the incubator and examined from time to time. In the course of twenty-four hours the activity had returned, and the germs had undergone considerable multiplication.

The constancy of this test may be inferred from the fact that Pfeiffer and Vagedes tested seventy different cultures of the cholera-bacillus and twenty of various other closely allied species, and found it reliable in all. The cholera-germs were always inhibited in their activity; the other species, never.

Pfeiffer announces that he is prepared to furnish serum of a sufficient immunizing strength for this test to any who desire to confirm the reliability of the test or to determine the nature of any suspected cultures.

### The Cause of Death in Acute Lobar Pneumonia.

Some recent observations of Bollinger (*Münchener med. Wochenschrift,* 1895, No. 32) made at autopsies in cases of pneumonia are of interest as suggesting a new factor in bringing about a lethal outcome of the disease. In addition to the causes of death usually recognized as operative in lobar pneumonia—intensity of infection, insufficiency of the lungs, complications, such as meningitis, etc., and heart-failure—Bollinger draws attention to oligæmia as a common and often very pronounced feature of the disease, and argues that the collapse often observed in it is due, in great part at least, to the diminished quantity of blood and consequent poor nutrition of the vital organs.

This belief is based upon the anæmic condition of all the organs, as observed at autopsy, more particularly of the skin, brain, liver, kidneys, and spleen, and the paucity of blood is attributed to the great drain upon it incident to the accumulation of the pulmonary exudate. This Bollinger finds to be often enormous. The weight of 100 pneumonic lungs showed that in fifty the exudate had accumulated in an amount greater than two pounds in weight; in forty there was between one and two pounds of exudate, and in only ten was there less than a pound. The diminution in the quantity of blood in the body seemed to bear a direct relation to the quantity of exudate.

Of course, without a defective generation of blood, the withdrawal of it in the exudate would quickly be compensated by the formation of a new supply by the blood-forming organs, and Bollinger is accordingly forced to suppose a diminished vitality of these organs in the cases in which oligæmia is marked. In this connection attention is drawn to the fact that leucocytosis in pneumonia has been shown to be a distinctly favorable prognostic indication, and Bollinger would interpret this leucocytosis as an evidence of blood-formation.

The critical collapse and heart failure so often met with in pneumonia are explained as the direct results of the oligæmia, in consequence of which the already greatly weakened heart-muscle gives out because of an insufficient blood- and oxygen-supply.

### ALIMENTARY TUBERCULOSIS.

ZINN (*Münchener medicinische Wochenschrift*, 1895, No. 37, 856) gives a detailed account of an interesting case of acute general miliary tuberculosis in a man thirty-eight years of age, in which the evidence points very strongly to an alimentary source of infection.

The lungs showed no old lesions of the disease in any part. At the ileocœlic junction there was a large cluster of cheesy mesenteric glands containing myriads of tubercle-bacilli, while in the intestine near the ileo-cæcal valve an old healed scar was believed to mark the site of the original ulcer through which the entrance of the infectious material had occurred. Above and below this point, in the small and large intestine, there were recent tuberculous ulcerations. Tubercles were also distributed along the course of the thoracic duct, whose lumen was in places completely filled by cheesy masses.

Zinn believes that the bacilli were conveyed in the lymph from the original intestinal ulcer to the neighboring mesenteric lymph-glands, the disintegration of which led to their further transport to the thoracic duct, through which they found entrance to the general circulation and gave rise to the general infection which caused the patient's death.

The exact source of the original infection was uncertain, but milk is mentioned as a possible carrier of the bacilli.

# HYGIENE AND PUBLIC HEALTH.

UNDER THE CHARGE OF
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AND

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## Toxicity of Alcoholic Beverages.

Dr. A. Jeffroy and Dr. R. Serveaux (*Archives de Médecine Expérimentale et d'Anatomie Pathologique*, 1895, p. 569) have devised a new method for determining the toxic equivalents of the various alcohols and other matters in alcoholic drinks. The liquids were injected into the circulation through the vein of the ear of rabbits, and in order to prevent clotting of the blood, which with other experimenters has always been a drawback, a watery extract of leeches was injected at the same time. This was obtained by macerating for four to six hours in dilute salt solution the anterior ends of leeches cut up into small bits. As a result of their experiments we have a table of equivalents which in some respects agrees with and in others disagrees with those of Dujardin-Beaumetz and Audigé. The toxic equivalents—*i. e.*, the amount in grammes necessary per kilogram to kill a rabbit—determined by their process were as follows:

| | Dujardin-Beaumetz. | Jeffroy-Serveaux. |
|---|---|---|
| Methyl alcohol | 7.00 | 25.25 |
| Ethyl " | 7.75 | 11.70 |
| Propyl " | 3.75 | 3.40 |
| Butyl " | 1.85 | 1.45 |
| Amyl " | 1.50 | 0.63 |
| Aldehyd | 1.00 | 1.14 |
| Furfurol | .... | 0.24 |
| Acetone | 5.00 | 5.27 |

In other words, the poisonous properties increase with the boiling-point and molecular weight. The toxic equivalent of new (genuine) cognac was found to be 11.41; that of apple brandy 10.57. Absinthe appeared to be extremely toxic, about like furfurol and amyl alcohol.

Dr. G. Daremberg, experimenting in the same line (*Archives de Médecine Expérimentale, etc.*, 1895, p. 719), found that, in general, reckoning from equal alcoholic content, the alcoholics are injurious in direct proportion as they are natural and least adulterated. If rectified spirits have been added, they become relatively less poisonous, since the particularly injurious matters, the higher alcohols, furfurol, aldehyd, etc., are especially present in natural wines and in spirits obtained by distillation of such wines. Thus cognac, the pure article, is more toxic than the artificial substitute made with pure alcohol. For instance, an old genuine cognac contains about 2 per cent. of impurities, chiefly fatty acids, as acetic, higher alcohols, as amyl alcohol, aldehyds as furfurol or pyromucic aldehyd; and all of these are much more poisonous than the ordinary ethyl alcohol. Apple brandy is more toxic than cognac, anisette and angostura bitters very toxic, and absinthe the "plus terrible des apéritifs." His conclusions are that of all alcoholic drinks the most dangerous are the liqueurs such as absinthe and anisette, the least harmful those made with pure alcohol and non-toxic flavors and without essential oils; that wines are proportionately more toxic than brandy, and white wines less than red.

Dr. J. Roubinowitch (*Gazette des Hôpitaux*, 1895, p. 237), speaking of the greater toxicity of alcohols with increase in the molecular weight, calls attention to the fact that the beverages distilled from cider, perry, grains, potatoes, and molasses are much more injurious than those derived from wine. In dealing with the question of restricting the use of alcohol by legislation, Dr. Roubinowitch, after considering the various methods, such as increasing the tax on alcohol, restricting the number of licenses, the Norwegian system, etc, concludes that the system of total prohibition is the best, and falls into the curious error of citing the results of the prohibitory laws of Maine as a most convincing argument, when, as is well known, Maine is practically a "free-rum" State. "Ce fut pour l'état du Maine une révolution des plus heureuses, puisque en peu d'années cet état, le plus pauvre de l'Union Américaine devint l'un des plus prospères."

## Infectiousness of Dust in Consumptive Communities.

Dr Irvin H. Hance (*Diebetic and Hygienic Gazette*, February, 1896, quoting from *Medical Record*) has conducted some instructive experiments to determine the danger of infection in a large community of consumptives, where all sanitary measures for the care and disinfection of sputa are enforced. These experiments were performed at the Adirondack Cottage Sanitarium, and a complete examination was made of the group of buildings, some of which had been occupied by consumptives for eleven years. Dust was taken from the places most likely to be infected. One square yard of dust from each of four buildings (the main building containing parlor, sitting-room, and library, the infirmary where all the acutely sick are sent, the oldest cottage and the newest) was collected and inoculated into ten guinea-pigs, and half a square yard from each of thirteen other cottages was collected and inoculated into others. The animals were kept from one to three months and then killed. In all, eighty-one were inoculated with from two to three cubic centimetres of sterilized water with the dust in suspension. Four inoculated with dust from the infirmary and main building died of other infectious diseases on the third to sixth day. Five of the ten inoculated with dust from the oldest cottage, which was always occupied by the sickest men, one of whom had been complained of by his room-mate for spitting about the cottage, were tuberculous. The dust from the other sixteen buildings occupied by consumptives was found to be absolutely free from infectious material. At this Sanitarium the methods taken to guard against infecting the cottages and public rooms are to burn all cuspidors daily and the Japanese napkins as soon after using as possible; never to expectorate except into the large sanitary cuspidors or into the small individual hand-cuspidors. Paper napkins are used in hemorrhage cases and where patients are too feeble to get up on their elbows to spit into the cuspidors, and these are burned after being once used. The cottages are built to insure thorough ventilation, the rooms wainscoted and painted rather than papered, thus permitting thorough cleansing, and they are furnished simply and with a minimum of tapestry. Not one of the twenty to twenty-five attendants has ever developed tuberculosis.

In this connection, the following from *Food and Sanitation*, January 18, 1896, is pertinent: Forty years ago Mentone was a healthy village in France, where lived peasantry happy on their farms, and their superb physical state conditioned by the climate. It was discovered that the region was a most healing climate for consumptives, and it became the Mecca for the unfortunates of Europe so stricken. The inhabitants abandoned their farms to wait upon the strangers. The strong, healthy women forsook their dairies and became the washerwomen of the consumptives' clothes. No precautions were taken ; the disease was not then understood as now, the theory of the tubercle-bacillus not having been discovered. The place to-day is bacillus-ridden, a pest-hole, death itself. The hitherto strong inhabitants are emaciated, a coughing, bleeding people, filled with the germs of consumption. The soil and the air are both contaminated with them. It is no longer a resort. The same fate, it is believed, awaits many other similar health-resorts unless active measures are taken to destroy all germs. This will be a most difficult task, because consumptives themselves, as a rule, are not thoughtful of the danger they spread or of the rights of others. They should bear in mind that if all others had been careful they, too, might have escaped.

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# THE THERAPEUTIC VALUE OF THE MIXED TOXINS OF THE STREPTOCOCCUS OF ERYSIPELAS AND BACILLUS PRODIGIOSUS IN THE TREATMENT OF INOPERABLE MALIGNANT TUMORS,

## WITH A REPORT OF ONE HUNDRED AND SIXTY CASES.[1]

By William B. Coley, M.D.,
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In a series of papers already published[2] I have reported the results of my investigations concerning the action of the streptococcus of erysipelas and its toxins upon inoperable malignant tumors. In the earlier papers an attempt was made to set forth the clinical and experimental evidence then existing in support of the view that an attack of erysipelas occurring by accident, or brought about by inoculation, in a patient suffering from malignant disease, not infrequently produced marked improvement, and in some cases permanent cure. It is unnecessary to go again over the ground, and it is sufficient to state that a considerable number of cases reported by competent observers, of undoubtedly malignant tumors, have been permanently cured by an attack of erysipelas. Czerny has recently added two most important observations bearing upon this question.

The seven observations of Fehleisen, in which he produced erysipelas by inoculation—in one of which the tumor disappeared entirely, and nearly all of which showed improvement—furnish additional evidence in support of the view that the streptococcus of erysipelas has in it some quality that exerts an antagonistic influence upon the cells of malignant tumors.

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[1] Read before the Johns Hopkins Medical Society, April 6, 1896.

[2] Annals of Surgery, September, 1891. The American Journal of the Medical Sciences, May and July, 1893; ibid., July, 1894. N. Y. Med. Record, January 19, 1895.

The case that led me to take up these investigations was one of small round-celled sarcoma of the neck, which had been operated upon by Dr. William T. Bull five times at the New York Hospital. At the last operation, in 1884, it was found impossible to remove the growth. The patient was given up as hopeless. A few days later an attack of erysipelas occurred, followed by a second attack shortly after the first had subsided. The tumor entirely disappeared. I was able to trace the patient and found him alive and quite free from recurrence in 1891, seven years afterward.

My first experiments were conducted with repeated injections of living bouillon-cultures of the streptococcus of erysipelas, introduced into the substance of the tumor, and the results in a series of ten cases were brought before the Surgical Section of the New York Academy of Medicine in December, 1892. Two of these cases, both inoperable, hopeless cases of recurrent sarcoma, are alive and well, one more than three years, and the other more than four years after treatment. The unmistakable improvement that followed the repeated injections even when no erysipelas was produced—especially in sarcoma—led me to believe that a portion, if not all, of the curative influence might be due to the toxins, rather than to the action of the germ itself.

This point was one that could be easily determined by experiment. The great advantages of the toxins over the living cultures were at once apparent. First, the element of danger, which was not inconsiderable, I myself having had two deaths from inoculating the living germ, was eliminated. Secondly, it was possible to regulate with some degree of accuracy the dose of the toxins, a thing quite impossible when using living cultures. Furthermore, my own experience, as well as that of others, had proved that it was often extremely difficult and sometimes impossible to produce erysipelas even with very virulent cultures.

In my first experiments with the toxins (in 1872) I simply sterilized the bouillon-cultures by heating them to 100° C., and then injected them into the substance of the tumor. The symptoms and reaction corresponded almost exactly with those following the use of the living cultures, though they were less severe and shorter in duration.

Knowing that the action of heat produced certain chemical changes in the toxic products of bacteria, I next used the soluble products by passing the living bouillon-cultures through a Kitasato filter and using the filtrate. The reaction was similar to that described following injections of the living cultures, but decidedly less severe and less persistent. The local redness and induration were also much less marked. The effect on the tumors, especially sarcoma, was to inhibit the growth, and in some cases to diminish the size. The solution was so weak that it required very large doses, 2 to 4 c.c., to produce much reaction.

In order to increase the virulence of the cultures and the strength of the toxins I made use of the principle demonstrated by Roger, of Paris, that the bacillus prodigiosus, a non-pathogenic organism, has the power to intensify certain pathogenic germs, notably erysipelas. As far as I am aware, no one had tried a combination of erysipelas streptococcus with any other germ, or their mixed toxins in the human being, nor had the idea ever been suggested in connection with the treatment of malignant tumors. With the valuable aid of Dr. Alexander Lambert, at that time Fellow in Bacteriology at the College of Physicians and Surgeons, a filtrate containing the soluble toxic products of the streptococcus of erysipelas (obtained from a fatal case) and another containing the soluble products of the bacillus prodigiosus were prepared. These solutions were sterilized by filtration without the use of heat, and preserved in glass-stoppered bottles by the addition of thymol crystals.

The two solutions were mixed at the time of using in about the proportion of one part of the bacillus prodigiosus toxin to four or five parts of the erysipelas-toxin. The reaction that followed was much more severe — a chill coming on in one-half hour to an hour after the injection, and lasting fifteen to forty-five minutes. Nausea, vomiting, severe headache, with temperature 103° to 104°, usually followed an injection of ♏ ij to iv of the bacillus prodigiosus toxins, with ♏ viij to xvj of the erysipelas-toxins. The reaction and disagreeable symptoms usually subsided within twelve hours, but not infrequently a marked herpes labialis followed. The effect upon the tumors was much more marked than when the erysipelas-toxins alone were used.

A little later, at the suggestion of Mr. B. H. Buxton, Director of the Loomis Laboratory (without whose untiring zeal and unremitting assistance during the past three years much of this work would have been impossible), the two germs were grown together in the same broth, the erysipelas streptococcus being first grown alone for ten days, the prodigiosus-toxin then added, and the two allowed to grow together for ten days. The results showed this to be a further improvement in technique. Two years ago I made another change, with a view to utilize whatever of value might exist in the toxins contained in the dead germs themselves. The cultures were heated to a temperature sufficient to render them sterile (which was found to be 58° to 60° C.) for one hour, and then used without filtration. This preparation proved to be by far the strongest, and experience has shown it to be superior to the filtered solution in its action upon malignant tumors.

The value of all the preparations of the toxins has been found to depend largely upon the virulence of the original cultures employed, and in the successful cases the toxins were all made from cultures obtained from fatal cases of erysipelas. The culture gradually loses its virulence after a few generations, and various means were used to restore it, the most efficient being to pass the culture through a series of rabbits. Marmorek, at the Pasteur Institute in Paris, has succeeded in developing a remarkable degree of virulence in the streptococcus by this method. The most powerful preparation of the mixed toxins that Mr. Buxton has been able to make produced very severe constitutional symptoms, with a prolonged chill and a temperature of 104½° in doses of one-half a minim (0.066 c.c.).

It is very important to remember that much larger quantities can be borne when injected subcutaneously than when injected directly into a vascular tumor, the difference being undoubtedly due to the more rapid absorption in the latter instance.

I have adopted the plan of beginning with a very small dose—*e. g.*, one minim of the filtrate, or one-half a minim of the unfiltered toxins—and gradually increasing the dose each day until the reaction-temperature reaches 103° to 104° F. The temperature has been the chief guide in estimating the dose, and very little benefit has been noted in cases in which no reaction was obtained. The frequency of the injections has depended upon the general condition of the patient and upon the rapidity of recovery from the depression of the preceding dose.

Usually the injections have been given daily, aiming to get two or three well-marked reactions during a week. If well borne, the treatment has been continued from two to three weeks, and if at the end of that time no decided improvement has taken place, it has been discontinued. In some of the successful cases it has been kept up for three or four months, occasional intervals of a few days' rest having been allowed. In several instances, in spite of the reaction and depressing effects, the patients have steadily improved in general condition and have gained markedly in weight.

With this brief *résumé* of the method of preparation, let us proceed to an analysis of the cases treated, which form the basis of the present paper. There are three important questions which a careful study of these cases ought to enable us to answer:

First. Have these toxins any antagonistic or beneficial influence upon malignant tumors?

Secondly. If so, in what varieties of tumors is this influence most marked?

Thirdly. Is this action permanent in character or merely temporary?

Grouping the cases according to their several varieties we have: Sarcoma, 94; round-celled, 52; spindle-celled, 14; melanotic, 7; chondrosarcoma, 2; sarcoma, special type of cell not stated, 8. Carcinoma, including epithelioma, 63; of breast, 31; of uterus, 3; of cheek, 4; of sternum (secondary), 1; of tongue, 4; of neck, 3; of rectum, 3; of lip, 2; sarcoma or carcinoma, 10 cases.

In addition to the above cases of malignant tumors eight other cases have been treated with the toxins. These were as follows: tubercular, 2 cases; keloid, 1; goitre, 2; recurrent fibro-angeioma, 1; mycosis fungoïdes, 1; fibroma, 1.

Of the cases of sarcoma, forty-five, or more than one-half, showed more or less improvement. The variety that showed the greatest improvement was the spindle-celled sarcoma; that which showed the least was the melanotic. Next to the spindle-celled, in the order of benefit, was the mixed-celled, round- and spindle-, then round-celled; while osteosarcoma closely approached the melanotic in showing but little effect of the toxins. In a series of seven cases of melanotic sarcoma no improvement was observed in five cases, and very slight change in the two others. It should be observed, however, that in most of these cases the tumors were multiple and the disease thoroughly generalized before treatment was begun. Yet, in all these cases the antagonistic action of the toxins was so trifling that, were it not for the fact that at least one case of melanotic sarcoma has been cured by accidental erysipelas, there would be little to encourage one to a further trial of the toxins in this class of cases.

With osteosarcoma the results are scarcely more satisfactory. Most of the cases showed slight improvement; one case, a very large osteochondrosarcoma was apparently cured, remained well for nearly a year, and then recurred. Further treatment caused temporary improvement, but the patient has since been slowly getting worse, and a fatal termination will undoubtedly occur. This case is very important on account of the size of the original tumor. The fact that it recurred after it had been once apparently cured renders the diagnosis absolutely certain.

In one case of round-celled sarcoma of the neck, of very rapid growth, the tumor decreased from the size of an orange to the size of a hen's egg in one week, after three injections of the mixed toxins. No further reduction took place, and in spite of large doses of the toxins the tumor again began to increase rapidly in size and caused death within three months. In many of the other cases of round-celled sarcoma the improvement was very striking, but in only two cases of purely round-celled sarcoma did a cure result.

In one case of round-, spindle-, and oval-celled sarcoma (recurrent) the tumors disappeared, and the patient is alive and well more than three years after treatment.

The spindle-celled variety, though embracing a small proportion of the total number of sarcoma cases, forms by far the largest proportion of successful cases. The reason for this remarkable difference in the action of the toxins upon the different types of sarcoma is not apparent, but an attempt to explain it will be made later on.

*Carcinoma.* I have thus far been extremely conservative in advocating the toxins in anything but inoperable sarcoma, though I have been steadily experimenting upon carcinoma. My results in carcinoma, while far from ideal, are still such as to lend encouragement to the belief that we are working along the right lines, and that at no very distant day we shall attain in carcinoma some measure of the success that has already been achieved in sarcoma.

The number of cases of demonstrated carcinoma that have been permanently cured by accidental erysipelas would seem to give additional weight to this view. I believe that we have in the toxins nearly, if not quite, all the virtue that exists in the living germ and in a form that can be utilized without risk to the patient.

I have seen undoubted improvement follow the injections of the toxins in a considerable number of cases of inoperable carcinoma. In two cases the tumors disappeared and the patients are at present well, one a year and nine months after treatment, and the other a year. A third case of rapidly growing, twice recurrent carcinoma of the breast, in which a large gland the size of a hickory-nut, encircling the axillary vessels high up, was left at the last operation, February, 1895, has shown very markedly the controlling and inhibiting action of the toxins. In April, 1895, the tumor had recurred in the cicatrix, measured one and a half by two and a half inches, and was growing rapidly. The pectoral muscle was hard and infiltrated. The patient has had the toxins three times a week since, or more than a year. The ulcerated carcinomatous base has been excised once since, but recurred in a few weeks. The induration in the pectoral muscle has nearly disappeared. The diseased gland left in the axilla cannot be felt, and there is no swelling of the arm. The patient weighs ten pounds more than a year ago, and is apparently well at present, June 9, 1896.

This case is not cited as even a probable cure, but simply to show in a striking way the influence of the toxins upon a rapidly growing, recurrent carcinoma, the diagnosis of which has been confirmed by several microscopical examinations.

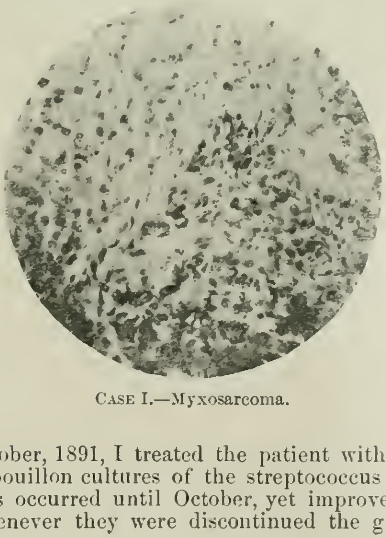
I believe that the chief value of the toxins in carcinoma will probably be found in their use after a primary operation to lessen the chances of recurrence. This is a question that can only be settled by several years of experiment. It seems, however, reasonable to believe that the toxins would have a far better chance to destroy the invisible traces of infection left behind after operation, than after a palpable tumor has developed. One surgeon has written me that he operated upon three cases of advanced carcinoma of the breast in which erysipelas developed during the wound-healing. In no case did recurrence follow, and the cases were traced for a long period—five to fifteen years.

Let us now turn to the third and by far the most important question, Is the action of the toxins permanent—that is, really curative—or not? It is evident that only cases that have remained well for a considerable length of time can be considered in answering this question. Four cases, all pronounced inoperable by well-known surgeons, and in every one of which the diagnosis was confirmed by careful microscopical examination by competent pathologists, are at present well and free from recurrence two and one-half to four and one-half years after treatment. It would seem proper to regard these cases as permanently cured. The oldest case cannot strictly be classed as a cure from the toxins alone, because living cultures were used. Yet this case is, I believe, the only one on record cured by artificially produced erysipelas that has been traced beyond one year. These four cases alone, which were completely hopeless, are, I think, sufficient to demonstrate the curative power of the streptococcus and its toxins upon sarcoma.

The most important cases are reported with some detail, and the remainder summarized.

CASE I. *A twice recurrent inoperable sarcoma of the neck with large secondary sarcoma of tonsil; treated with repeated injections of living cultures of erysipelas for four months; well four years after treatment.*—The patient had been operated upon twice by Professor Durante of Rome, and last by Dr. W. T. Bull at the New York Hospital in March, 1891. The tumor of the neck was so large that only a portion could be removed, and the general condition of the patient when I began treatment, May 4, 1891, was so bad that he was expected to live but a short time. The tonsillar tumor was so large that it was impossible to swallow solid food, and liquid food was taken with difficulty.

FIG. 1.

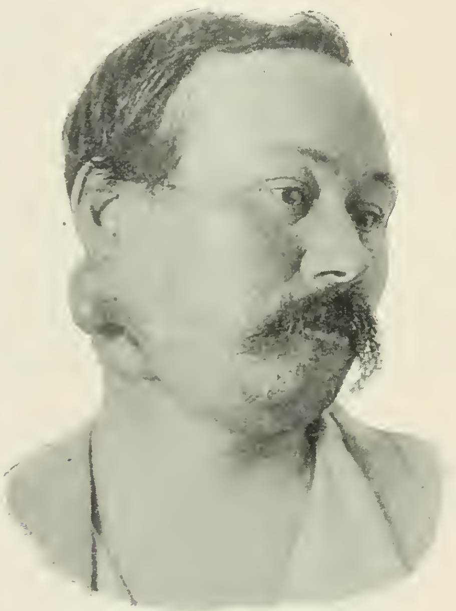


CASE I.—Myxosarcoma.

From May 4 to October, 1891, I treated the patient with repeated local injections of living bouillon cultures of the streptococcus of erysipelas. No attack of erysipelas occurred until October, yet improvement followed the injections, and whenever they were discontinued the growth increased in size.

On October 8th a severe attack of erysipelas followed the injection of a new and more virulent culture. During this attack the tumor of the neck nearly disappeared, the tumor of the tonsil decreased in size, and the general condition of the patient rapidly improved until he had regained his usual health and strength. He has had no treatment since October 8, 1891, and he was in good health in October, 1895. He has been repeatedly examined by myself and other surgeons. My last examination, made in September, 1895, showed a small mass at the site of the old scars upon the neck, apparently made up of cicatricial and fibrous tissue. It had remained unchanged for four years. The tumor of the tonsil was still present, though it had apparently shrunken some in size, and the features of malignancy must have been either entirely lost or in complete abeyance. The general condition was excellent.

FIG. 2.



CASE I.—Inoperable sarcoma of neck.

[Copy from Records, N. Y. Hospital Laboratory.]

*Specimen No.* 1870. *Microscopical examination and report.* "Operation, a piece of tumor about the size of an orange was removed, but a portion yet remains, being too deeply seated for extermination.

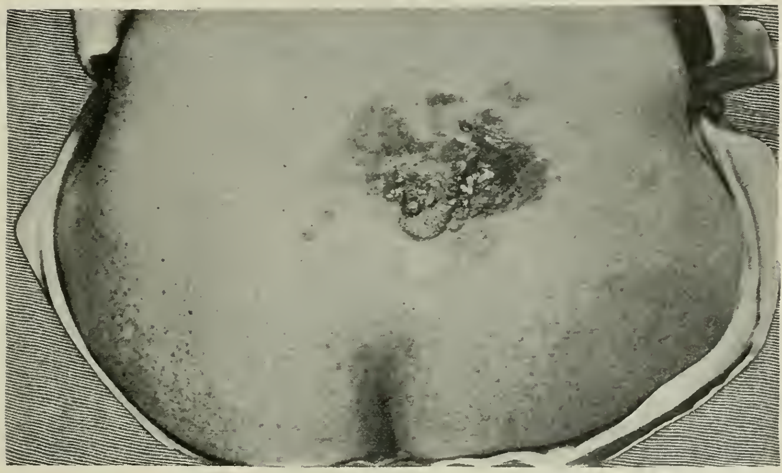
"Microscopically the tumor (Fig. 1) is composed of fibrous tissue and spindle-cells, the fibrous tissue predominating in places and in others the spindle-cells.

"There are many areas of cells resembling mucous cells, and to be differentiated from myxomata; vascular supply abundant and vessel walls-formed by tumor-tissue.

"Diagnosis, 'myxosarcoma.'"—Dr. Farquhar Ferguson, Pathologist to the New York Hospital.

CASE II. *Large recurrent sarcoma of the back and groin; entire disappearance of both tumors; patient in perfect health without recurrence four years after the beginning and more than three years after the cessation of treatment.*—This patient was a male, aged forty years, with a sarcoma of the back (lower lumbar region) 7x4 inches, with a secondary tumor the size of a goose-egg in the groin. The groin-tumor had been removed in January, but rapidly recurred. The patient was examined by Dr. William T. Bull, who regarded the case as inoperable sarcoma. The same diagnosis was made by a number of other surgeons. The tumor (Fig. 2) was photographed by Dr. George H. Fox, and a section was removed under cocaine and examined by Dr. Farquhar Ferguson, pathologist to the New York Hospital, and the diagnosis confirmed.

FIG. 3.



CASE II.—Sarcoma of back and groin. Well three and a quarter years after treatment.

A full history of the case has already been published.[1] Treatment was begun in the erysipelas-wards of Bellevue Hospital in April, 1892, and daily local injections of living bouillon-cultures of erysipelas were given for two weeks before an attack of erysipelas was produced. The attack was very severe, but during the attack and the few succeeding days both tumors entirely disappeared. Recurrence followed in July, and both tumors grew more rapidly than before. The injections were resumed, and between October, 1892, and January 1, 1893, he had four additional attacks of erysipelas, but mild in character.

In December, 1892, he was exhibited before the Surgical Section of the New York Academy of Medicine. The influence upon the tumors was striking, but less marked and more temporary than the first attack. In January, 1893, I removed the recurrent back-tumor, but left the groin undisturbed. After three weeks there was an apparent recurrence in the back, and I began using the toxic products of erysipelas and bacillus prodigiosus, injecting them locally into the groin-tumor. This preparation was the one made by filtering toxins through porcelain. The two toxins were mixed at the time of using.

The tumors quickly disappeared. The injections were discontinued in March, 1893, and the patient has been in perfect health ever since. (A photograph was taken in April, 1896.)

[Copy from Records, N. Y. Hospital Laboratory.]

*Pathological report.* "The tumor (Fig. 4) is a sarcoma, in which the cells are round, oval, and spindle, in which everywhere there is seen a stroma of fibrous tissue, apparently the remains of the subcutaneous tissue which has not been completely destroyed during the development of the tumor. Yellow elastic fibres are quite abundant throughout the tumor, but the vascular supply is not very abundant "—Dr. Farquhar Ferguson, Pathologist to the New York Hospital.

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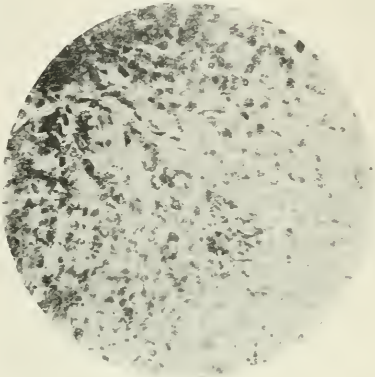
[1] THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES, July, 1894.

FIG. 4.



CASE II.—Sarcoma.

CASE III. *Large inoperable sarcoma of the abdominal wall and pelvis; entire disappearance of tumor; no recurrence three years after.*—This case, a boy sixteen years of age, was pronounced inoperable by Dr. L. Bolton Bangs, at the time professor of genito-urinary surgery at the Post-Graduate Hospital. A section of the growth was removed and pronounced spindle-celled sarcoma by Dr. H. T. Brooks, the pathologist to the hospital. Dr. Bangs referred the patient to me for treatment with the toxins, and he was admitted to the New York Cancer Hospital in January, 1893. He was treated for nearly four months with the mixed filtered toxins of erysipelas and bacillus prodigiosus. At the end of this time the tumor had nearly disappeared, and the little that remained was gradually absorbed after the injections were discontinued. There was no breaking-down, and the entire growth disappeared by absorption. The original growth was 7x5 inches in extent, involved apparently the entire thickness of the abdominal wall, was attached to the pelvis, and from symptoms and position evidently involved the bladder-wall. The boy's general condition improved with the disappearance of the tumor, and he has enjoyed the best of health since. He was shown to the members of the New York State Medical Association on October 16, 1895, and was examined by the Medical Board of the New York Cancer Hospital, December 14, 1895. There was no evidence of the tumor remaining. The case is well, May 11, 1896.

*Pathologist's report:* "Spindle-celled sarcoma."—Dr. Henry T. Brooks, Pathologist to the Post-Graduate Hospital.

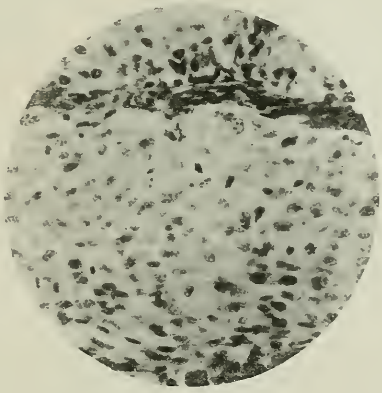
CASE IV. *Large inoperable sarcoma of the abdominal wall; entire disappearance; no recurrence two and one-half years afterward.*—This patient was a woman, twenty-eight years of age. An exploratory laparotomy had been performed at the Massachusetts General Hospital, by Dr. Maurice H. Richard son, in August, 1893. The growth was found too extensive to permit of removal, and the wound was closed. A portion of the tumor was removed and examined by the pathologist to the hospital, Prof. W. F. Whitney, of the Harvard Medical School. The diagnosis was "fibro-sarcoma." (Fig. 5.)

The patient was sent to me by Dr. Richardson in October, 1893, for treatment with the toxins. Local injections of the mixed filtered toxins were given for six weeks; then, after an interval of one month, they were given for four weeks. At the end of this time only a slight induration remained at the site of the tumor. A few weeks later this also had gone away, and the patient is still in perfect health two and one-half years after, without a suspicion of hardness in the region of the tumor.

In the discussion of my paper before the American Surgical Association, in June, 1894, Dr. Richardson, in reference to this case, said:

"In this case there was no doubt, according to accepted methods of diagnosis, that the woman had a malignant and necessarily fatal disease. The mass filled the right lower quadrant of the abdomen when I operated. I first incised in the median line and came down on the tumor. I then made an incision in the lateral region, with the same result. There was nothing to be done surgically. I took out a section and had it examined. It was pronounced sarcoma. The patient was sent to New York in October. When she came back there was a little induration about the scar. In May there was not the slightest sign that could be detected. Unless the diagnosis was entirely wrong; unless the history, gross appearance, and microscopic examination were entirely wrong, this was a case which must have died sooner or later."

FIG. 5.



CASE IV.—Fibrosarcoma.

August 31, 1893.

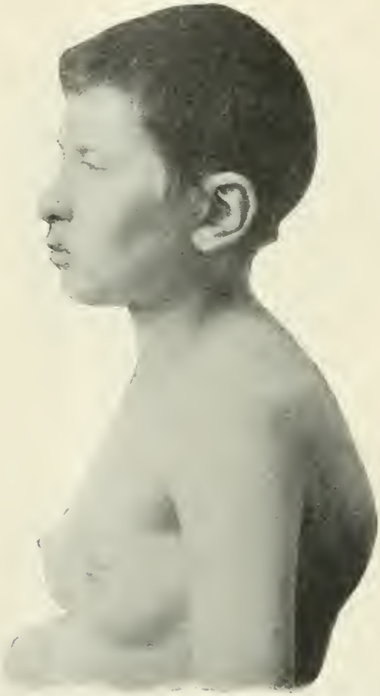
"The specimen from the tumor of the abdominal wall was a small, dense, ill-defined, whitish, fibrous-looking mass, which on microscopic examination was found to be made up of large numbers of small cells with a tendency to form fibres. This latter condition was more marked in some places than others. The diagnosis is fibrosarcoma."—Dr. W. F. Whitney, Pathologist to the Massachusetts General Hospital and Curator of the Warren Museum, Harvard Medical School.

[In a personal letter Dr. Whitney states that there was not the slightest doubt of the diagnosis in this case.]

CASE V. *Sarcoma of the leg and popliteal region three times recurrent; disappearance; freedom from recurrence for one and one-half years; then recurrence in the gluteal region.*—This patient, a girl fifteen years of age, had undergone three operations at the New York Hospital, by Dr. William T. Bull. The tumor was a spindle-celled sarcoma, originally starting in one of the metatarsal bones. A Syme's amputation was performed in 1890. Six months later local recurrence appeared in the stump, quickly followed by a second tumor in the popliteal space. In January, 1894, the tumor in the popliteal region was the size of a child's head, and the one in the stump the size of a hen's egg. This large tumor, or as much of it as was possible, was removed by Dr. Bull in January, 1894, but the smaller one was left undisturbed in order to try the effect of the toxins.

The toxins were given at the New York Hospital, under Dr. Bull's direction, for about two months. The tumor of the stump entirely disappeared, and the patient gained seventeen pounds. She was afterward transferred to my service at the New York Cancer Hospital and the injections continued for a time. The indurated mass in the calf slowly disappeared and the patient remained in good health until the last of October, 1895; a tumor of considerable size was then discovered in the right gluteal region, deeply attached, and occupying the space between the greater trochanter and the tuberosity of the ischium. The toxins were resumed, local injections being made into the tumor. There was slow improvement, the most marked features of which were the increase in mobility of the tumor and the more sharply defined outline. There was also some decrease in size. By February, 1896, it was thought that it could be safely removed, and I excised it under ether. The mass was about the size of two fists, deeply attached and partially encapsulated. The wound healed by first intention and the patient is at present in good health.

FIG. 6.



CASE VI.—Spindle-celled sarcoma of scapula and chest-wall, before treatment. Well nearly two years after. Photograph one and a half years after treatment.

*Pathologist's report* (No. 1845): "Tumor the size of a child's head, measuring 9 x 7 x 4 ½ centimetres, partly surrounded by a smooth capsule, but presents many freshly incised surfaces; whitish in color; very firm; of little vascularity; and presenting the appearance of fibro-sarcoma.

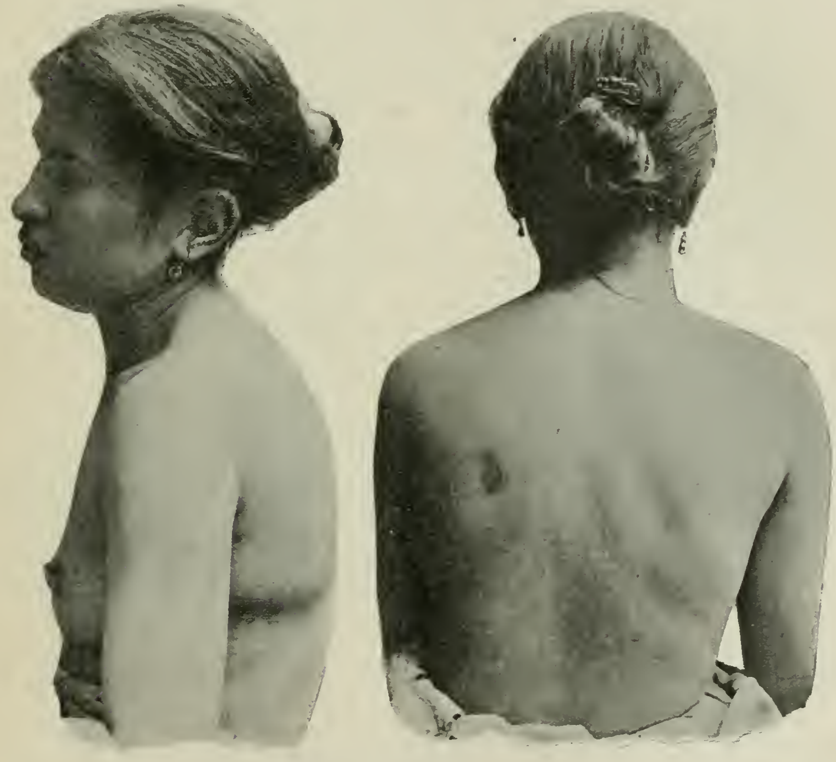
"Microscopic examination of the tumor shows the typical structure of a fibro-sarcoma, with sarcoma elements predominating; vascular supply fairly predominant."—Dr. Farquhar Ferguson, Pathologist, New York Hospital.

[Copy of Records, N. Y. Hospital Laboratory.]

*Pathologist's report of tumor removed February*, 1896: "Spindle-celled sarcoma."

CASE VI. *Sarcoma of the scapula involving a large part of the left half of the thoracic wall; entire disappearance of the tumor under three months' treatment; patient at present in perfect health without recurrence twenty-three months later.*[1]—The patient was a girl, aged sixteen years, and was admitted to the incurable ward of the New York Cancer Hospital, June 20, 1894. The tumor began in the region of the left scapula, four months before, and at the time the treatment was begun the growth extended to the vertebral line behind, measured thirteen inches vertically, extended around beneath the axilla to the sternum in front. The growth was firmly fixed to the scapula and to the ribs. It was about two inches in thickness in the scapular region. (Fig 6.) The skin over it was perfectly normal and movable. The left arm was so bound down by the

FIG. 7.



CASE VI.—Sarcoma of scapula. Photograph nearly two years after treatment.

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[1] A full description of this case will be found in an earlier paper. New York Medical Record, January 19, 1895.

new growth that it could not be raised to the horizontal position. The general condition was much impaired. The mixed unfiltered toxins were injected locally in the scapular portion of the tumor, and continued, with occasional intervals of one or two days, for three months. The improvement was immediate and very striking.

After three weeks the arm could be raised to a vertical position, and in October, 1894, after three months' treatment, the tumor had entirely disappeared by *absorption* only; she has had no treatment since, and remains perfectly well, July 30, 1896. (Fig. 7.) I regard this case as the most remarkable one in the entire series. It was one of the most extensive tumors that I have ever seen, and I hesitated about even making a trial of the toxins, so completely hopeless did it appear. There was no evidence of previous inflammatory, tubercular, or specific trouble, and the diagnosis could scarcely have been questioned even without confirmation by careful microscopic examination; but the examination made from a section nearly an inch long, removed from the thickest part of the tumor by means of a large-sized Mixter punch ($\frac{1}{8}$ inch in diameter), showed it to be typical "spindle-celled sarcoma."

*Pathologist's report on section removed from scapular portion of tumor:* "Spindle-celled sarcoma."—Dr. H. T. Brooks, Pathologist to N. Y. Post-Graduate Hospital.

CASE VII. *Epithelioma of the chin, lower jaw, and floor of mouth; inoperable; patient well without recurrence two years later.*—This patient, a woman aged thirty-four years, was admitted to the Methodist Episcopal Hospital in May, 1894, with a rapidly growing tumor involving the central portion of the lower jaw, the floor of the mouth, and the soft parts of the chin. There was an area the size of a silver half-dollar upon the chin, which was the seat of a typically epitheliomatous ulcer. A portion was removed and pronounced by the pathologist epithelioma. The tumor had a history of four months' growth. Dr. George R. Fowler regarded the case as inoperable and without hope. He stated that the only operation that could be done would be removal of the lower jaw, floor of mouth, and a part of the tongue; that the risk of death from the operation would be great, and that recurrence within a few months would be almost certain. Dr. Fowler referred the patient to me for treatment with the toxins. In view of the tumor being epithelioma I gave a very bad prognosis, but promised to try the injection.

She was admitted to the New York Cancer Hospital early in June, 1894, and was treated with *mixed toxins unfiltered* (B. prodigiosus and S. erysipelatosus) for about ten weeks. The injections were made into the chin and repeated daily as a rule. In three weeks the ulcerated area had entirely healed, and the diseased portion in floor of mouth had greatly improved.

In September, 1894, the patient had become very much run down from the long-continued injections and severe reactions, and two small ulcers one-fourth inch in diameter appeared in the chin. She was sent home to recuperate. Her only treatment since that time was the administration of tonics and local application of electricity to the chin for a short time by Dr. Sarah V. Burnette.

I had a photograph of her taken October 7, 1895. She was examined by a number of surgeons, December 14, 1895. No indication could be detected in the scar nor in the floor of the mouth, and the patient was in perfect health. The patient was quite well in June, 1896.

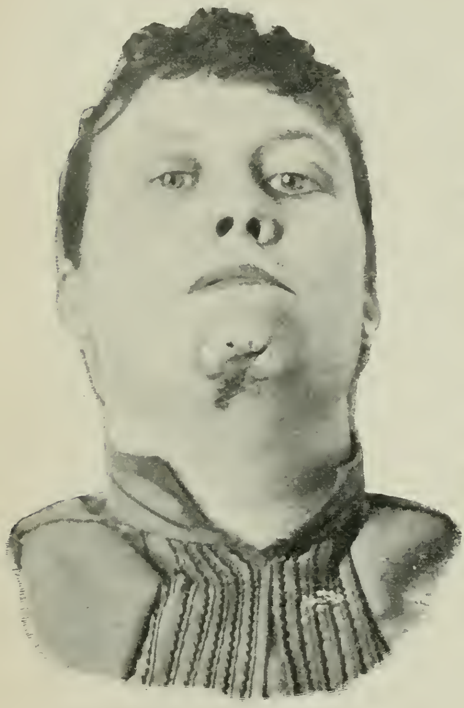
*Pathologist's report:* "Material from chin and lower jaw, May 20, 1894. Sections were not entirely satisfactory, but from gross appearance of the materials and those revealed by the microscope the diagnosis of epithelioma is offered."—William N. Belcher, M D.

Dr. Fowler, in a letter enclosing the pathologist's report, states:

"While I am sure that the case was one of epithelioma, judging from the clinical standpoint, and based upon the history of its rapid growth as well as its recurrence upon removal, yet I am fully aware that epithelial findings, from every standpoint, should be absolutely beyond question. Dr. William

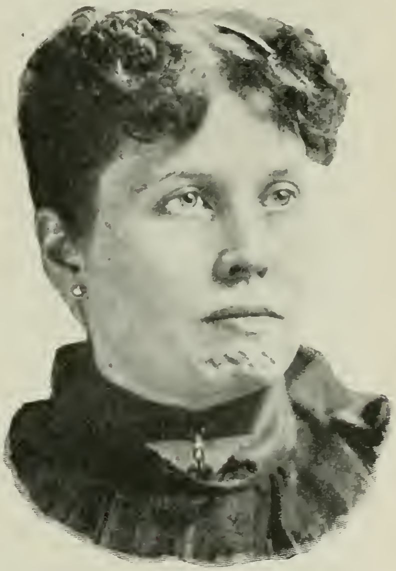
N. Belcher, pathologist to the Methodist Episcopal Hospital, and member of the Brooklyn Pathological Society, made the report, and in a letter explaining his report he states: 'The fragments were frozen by the use of the carbon-dioxide apparatus, and free-hand sections made. Notwithstanding the unsatisfactory picture revealed by the microscope, there seemed to me to be sufficient to warrant the opinion that the material was of an epitheliomatous character. Upon consulting the hospital records, I find that the diagnosis of epithelioma was made by the operating surgeon, presumably prior to my report, and it would seem to me to be as nearly correct as any diagnoses can be.'"

FIG. 8.



CASE VII.—Epithelioma of chin and floor of mouth. Before treatment.

FIG. 9.



Same patient one and a half years after treatment. Patient well two years.

This case is presented as fairly as possible, and the profession may form its own judgment as to its value.

CASE VIII. *Recurrent epithelioma of the face.*—The patient, aged forty-five years, male, had a small recurrent epithelioma of the face involving the lower eyelid. The primary tumor I had removed by operation. at the New York Cancer Hospital, eighteen months before, and microscopic examination by Dr. E. R. Dunham proved the growth to be epithelioma. Although the tumor in this case was not extensive, its removal by operation would have necessitated enucleation of the eye, and since he had lost the other eye in youth, I decided to try the toxins before sacrificing the eye. The recurrent tumor was treated at the hospital in February and March, 1895. The growth apparently entirely disappeared, and the patient had had no return up to January, 1896.

CASE IX.—E. I., female, aged twenty-three years, born in Switzerland, lived in the United States for six years. In May, 1894, she had a pain in the right hypochondriac region. Attacks of pain became more and more frequent and severe, and in August, 1894, were so bad that the patient was confined to bed. Operation, German Hospital, August 16, 1894, by Dr. Willy Meyer: Exploratory laparotomy; tumor was found apparently springing from the mesentery, but attached to the omentum and the gall-bladder. It was found impossible to remove it, but a portion was excised for examination and abdomen closed. In September, 1894, she was sent to me by Dr. Meyer for treatment with the toxins. At the time there remained a sinus at the centre of the abdominal incision, discharging a thin, viscid fluid. Palpation showed an intra-abdominal mass beneath the cicatrix about four inches in diameter. General condition fair. She was put upon the treatment with the mixed toxins of erysipelas and bacillus prodigiosus, injections being made sometimes in the abdominal wall, sometimes in the buttocks. The injections were given at intervals of every other day, and continued with occasional intervals, until February 7, 1895. There still remained a small sinus at the site just above described, and only an indistinct resistance remained at the site of the tumor. General health seemed perfect. She was readmitted to the hospital in order to attempt to close the sinus, which persisted, and at times became blocked up and caused considerable pain and discomfort. Two attempts were made to close the sinus under ether, the last in September, 1895. An incision carried down to the peritoneum enabled one to make a very thorough examination of the contents of the abdomen, but failed to discover the presence of a tumor. The cicatricial tissue about the sinus was carefully excised and the wound allowed to heal from the bottom. The peritoneum was not opened. Patient was discharged from the hospital on October 12th, sinus still persisting. Examination on January 25, 1896, showed the sinus closed; there was no distinct tumor present, but there was some induration in the region of the cicatrix, which apparently had increased since her discharge from the hospital on October 12th.

Operation, March 4, 1896. An incision three inches long was made at the site of the old cicatrix, and the sinus was followed up until it entered a closed pouch containing two to three ounces of muco-purulent fluid. By carefully enlarging the incision the finger was introduced and the pouch proved to be the gall-bladder. Several calculi about one-half inch in diameter were found tightly wedged in the cystic duct. These were dislodged with great difficulty and the cavity of the gall-bladder drained with iodoform-gauze. The peritoneum was opened for a distance of about one inch and quickly closed with catgut sutures. The most careful examination of the patient failed to reveal the slightest evidence of the tumor which was present at the time of Dr. Meyer's operation one and one-half years before.

In a letter describing his operation, Dr. Meyer states:

"At the physical examination previous to operation, in August, 1894, there was a small, irregular swelling on the outer side of the right rectus muscle about two fingers' width above McBurney's point. On entering the abdominal cavity I found a hard, irregular infiltration, which involved the omentum, ascending colon, loop of small intestine, and the border of the liver, matting together all these parts. Clinically the disease impressed me, as also everybody present, as a malignant growth, probably sarcoma. To define clearly its origin was impossible; it seemed to start from the omentum, as this was especially involved. To remove the growth radically seemed impossible. I also had not the permission of the relatives of the patient to do any major—perhaps here fatal—operation, which latter, in order to be radical, would have to consist in a resection of a portion of the large as well as of the small intestine, and also of a portion of the liver, besides the omentum. I therefore removed a wedge-shaped piece of the growth for microscopic examination and closed the wound in the tumor by two catgut stitches. I regret now not having palpated at that time the gall-bladder, but a primary disease of the latter, probably due to the presence of gallstones, did not enter my mind at all. Microscopic examination of the piece removed was made by the pathologist of the German Hospital, Dr. F. Schwyzer, who at that time pronounced it to be round-cell sarcoma Permit me to congratulate you on the outcome of this very interesting and important case."

Case X. *Sarcoma of the spine.*—Miss H , aged twenty-eight years, had a small tumor situated about half-way between the right breast and axilla, removed a year and a half ago. It was pronounced benign by the surgeon, but it is doubtful whether a microscopical examination was made. A year ago she began to develop a small swelling in the spine, about the tenth dorsal vertebra. It was supposed to be due to beginning Pott's disease, and was treated accordingly. In June she consulted Dr. V. P. Gibney, of New York, who considered the diagnosis of Pott's disease as probable, and treated her for some time with a plaster jacket. The jacket caused increase rather than decrease of the pain; the swelling slowly but perceptibly increased in size, and her general health became very much impaired. In December, 1894, the tumor had become of such size, and the pain so severe, that the theory of Pott's disease was given up, and a diagnosis of sarcoma of the spine was no longer doubtful. The patient was referred to me by Dr. Gibney, with the idea of trying the toxin treatment if the condition of the patient would permit. When I examined her the middle of December, in consultation with Dr. William Maddren, of Brooklyn, she had been bedridden for several months, and was very much emaciated. Her lower extremities were completely paralyzed, and numerous bedsores were present over the sacrum and ilium. Her heart-action was very feeble and rapid, and her urine contained albumin and casts. Over the lower dorsal region there was a fusiform swelling about six inches in length, the outlines of which were poorly defined. The tumor was absolutely fixed to the spine, so much so that it seemed an enlargement of the spine itself. A peculiar œdematous condition of the skin was present both over the tumor and the entire lower extremities. The condition of the patient was so desperate that I advised against attempting the treatment. A few weeks later, at the urgent request of the family and the attending physician, Dr. Maddren, I began giving very small doses. The treatment was continued by Dr. Maddren; the injections were given sometimes every day, and others at intervals of two days, and kept up for one month. At the end of one month I again saw the case, and the improvement was nothing less than wonderful. The peculiar œdema above referred to had almost entirely disappeared; the tumor itself had diminished very markedly in size; the patient was able to move both legs; the bedsores had taken on a healthy appearance and had partially healed, and the general condition in every way had markedly improved.

The improvement continued until April, 1895, when the bedsores had healed; the patient had regained control over the bladder and rectum, and was able to stand upon her feet and walk a few steps with support. No further improvement occurred, and in May, 1895, she began to get worse, and slowly failed until August, 1895, when she died. Before death other tumors developed in different parts of the body, rendering the diagnosis certain. Two small recurrent tumors in the region of the breast at the site of the original tumor disappeared under the injections of the toxins, although the injections were given in the back.

Case XI. *Sarcoma of iliac fossa; partial disappearance.*—The patient, aged fifty-five years, was born in Ireland, and had nothing worthy of note in his family or previous history. In January, 1893, he noticed a swelling in his right iliac region. It was accompanied by some pain, and grew steadily in size.

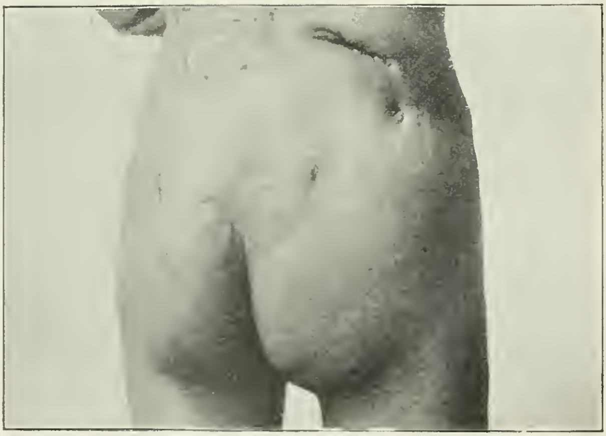
When I first saw him, in June, 1893, when he was admitted to the New York Cancer Hospital, there was a tumor about the size of two fists deeply seated in the right iliac fossa. There was marked pulsation, which was regarded as transmitted, and the tumor was diagnosed as sarcoma. An exploratory incision was made, extra-peritoneal, and a portion removed, and the diagnosis confirmed.

Injections of the erysipelas and prodigiosus toxins were at once begun, and continued with occasional intervals the greater part of the entire year. The tumor slowly decreased in size, and at the present time the greater part of it has been absorbed. The patient was in good health one year after treatment, and then lost sight of.

CASE XII. *Spindle-celled sarcoma of palm of hand, six times recurrent; treated with the toxins with temporary success; tumor recurred one year later.*[1]—A rapidly growing sarcoma of the palm of the hand had been held in check for a year and a half by injections of the mixed toxins given at intervals during this period. In June, 1894, the treatment was pushed for three weeks, at the end of which time the necrosed tumor-tissue was removed under ether. No further treatment was given and the patient regained twenty pounds of lost weight. She remained well until August, 1895, when she had a local recurrence, and amputation of the forearm was performed by Dr. Samuel Lloyd. The patient now shows signs of recurrence in the brain.

CASE XIII. *Very large osteo-chondrosarcoma of ilium; disappearance of tumor; recurrence seven months later.*—This case is one of great importance on account of the size as well as the character of the neoplasm. A full history of the case has been published in the paper referred to (*loc. cit.*), and only the main points will be noted here. The patient was a man, twenty-three years of age, with a tumor of one year's duration, occupying a larger portion of the right ilium, and extending from the middle of the sacrum behind to the border of the right rectus in front, filling up the larger portion of the right iliac fossa. He was much emaciated and rapidly losing ground. I saw the patient at the request of Drs. George F. Shrady and F. Kammerer, under whose charge he was, at St. Francis's Hospital. The toxins were begun in March, 1894, and continued under my direction for five weeks. Marked reactions followed the injections (mixed filtered toxins). The tumor after a few days began to soften and break down, and a large area of fluctuation appeared. Free incision permitted the escape of much broken-down tissue and large masses continued to slough out for a considerable time.

FIG. 10.



CASE XIII.—Very large osteo-chondrosarcoma of ilium.
Photograph taken seven months after successful treatment with the mixed toxins.

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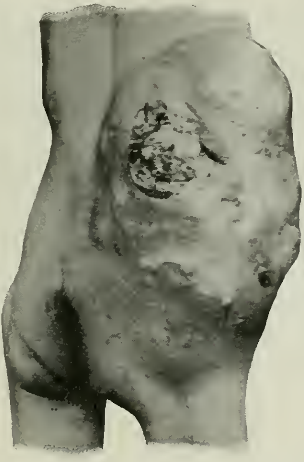
[1] The full history of this case may be found in a former paper. New York Medical Record, January 19, 1895.

High temperature continued for a month after the injections were stopped, due to the absorption of dead tissue. At the end of this time improvement began, and he rapidly regained his health and strength. By November 15, 1894, the tumor had apparently entirely disappeared and the patient had gained twenty-nine pounds since August, fully forty pounds since June, and had resumed his work. He was shown before the Surgical Section of the New York Academy of Medicine, and Dr. Shrady regarded him as cured. In December, 1894, there was evidence of local recurrence, and in spite of further treatment with the toxins the tumor has steadily increased in size up to the present time. His condition is hopeless, though he is able to walk about with a cane.

FIG. 11.



CASE XIII.—Recurred eight months after treatment. Photograph one and a half years after.

No microscopical examination of the original tumor was made, but the rapid growth and enormous size made the diagnosis clear, while the recurrence and prospective fatal issue confirm it. The patient died in July, 1896.

CASE XIV. *Recurrent angiosarcoma of the breast treated with erysipelas-serum.*—A. C., female, aged fifty-nine years, United States. Family history good. Seventeen years ago she was hit upon the left breast by a little boy of seven years; three months later at the site of the blow there appeared a small lump; this grew slowly, was accompanied by some pain, and at the end of three years had reached the size of a fist. The first operation was then performed (fourteen years ago) at St. Francis's Hospital. The breast was not removed, and there were no enlarged glands in the axilla. She remained free from recurrence for seven years, when a tumor recurred, grew slowly for two years, and was then operated upon a second time at the same hospital, by Dr. George F. Shrady (May, 1889); the tumor at this time was the size of an egg, and the diagnosis made by Dr. Shrady was sarcoma. She again remained free from disease for two years, when a tumor recurred *in situ*. Examination January 20, 1895, showed a large tumor occupying the region of the left breast, extending from the anterior axillary line to the sternum, and from just below the clavicle nearly to the free border of the ribs. The tumor was fairly well fixed to the chest-wall, and was markedly protuberant, made up of more or less distinct nodules, the surface of which was purple in color, and in places there was considerable ulceration with foul discharge. The tumor was unquestionably inoperable. The patient's general condition was so extremely weak that she was scarcely able to walk alone. She was admitted to the New York Cancer Hospital on

January 20, 1895, and placed in the "incurable" ward. The disease was so far advanced and the general condition was so bad that no attempt was made to give her the toxins. After the ulcerated surface had become somewhat less foul under careful treatment, and her general condition a little improved, she was placed under treatment with injections of the antitoxin-serum of erysipelas and bacillus prodigiosus. This serum was prepared by Mr. Buxton in a manner similar to the diphtheria-serum—the toxins of erysipelas and prodigiosus having been injected daily into a horse for about six weeks, and the serum then withdrawn.

FIG. 12.

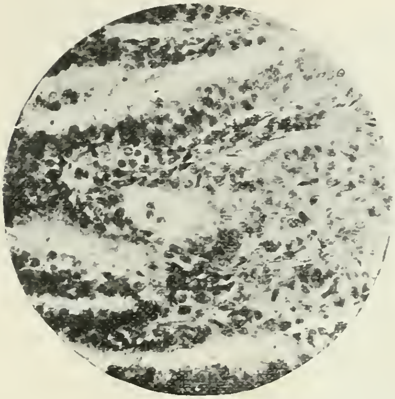
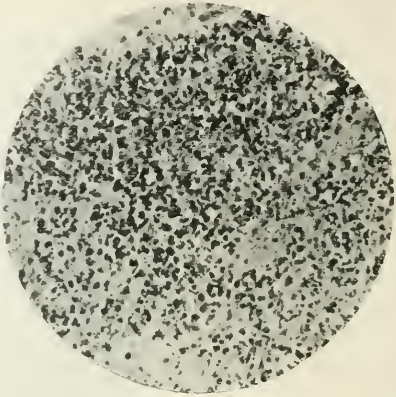


FIG. 13.



CASE XIV.—Angiosarcoma of the breast.

*Effect of the injections.* In small doses of 5 to 10 minims very little effect was noticed. Larger doses, 15 to 20 minims, frequently caused intense muscular pain and an urticaria-like condition of the skin, sometimes extending over the whole back and chest, being the cause of intense itching and discomfort. Patient also complained of very severe headaches, lasting sometimes for several days. The dose was never carried beyond 20 minims, but was, as a rule, given daily. The tumor soon began slowly to decrease in size, and

FIG. 14.

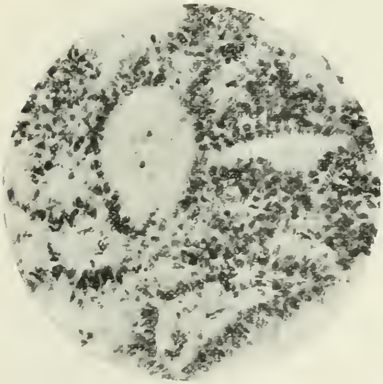
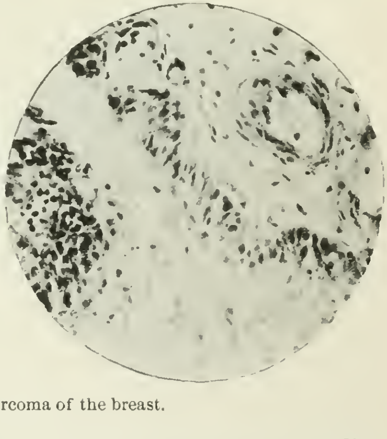


FIG. 15.



CASE XIV.—Angiosarcoma of the breast.

became much more movable; the general condition of the patient likewise slowly improved. Treatment was continued, with occasional intervals, until September, 1895. At this time the tumor had become so small that it could be easily removed by operation, and not having shown any great diminution in size during the past month, it was deemed advisable to remove it. Ether given, a mass was removed. The periosteum of the ribs was not involved, but as the skin over the tumor was diseased, a large area, four by six inches, was left to heal by granulation. No further treatment was given; the ulcer healed over as rapidly as could be expected, and on December 14th it had entirely healed. There were a few small glands, about one-fourth of an inch in diameter, in the left axilla, but, as the glands on the opposite side were even more enlarged, no attempt was made to remove them. Patient was discharged from hospital the latter part of December, 1895. Examination January 30, 1896, showed the patient in good general condition; no evidence of recurrence found.

*Microscopical examination by Prof. T. M. Prudden.* "I have examined a large number of sections from different parts of the tumor of breast, and, although there is considerable diversity in detail of the said growth in different parts, I think that the structures are all referable to the type of angiosarcoma, which accordingly is the anatomical diagnosis." (Figs. 12, 13, 14, and 15.)

CASE XV. *Recurrent spindle-celled sarcoma of the palm of hand; entire disappearance.*—Miss M., aged eighteen years; family history good; injured right hand two years ago. In July, 1895, noticed a small swelling in the palm of the right hand. In October, 1895, it had reached the size of half a hickory-nut, and was removed. The wound suppurated and was seven weeks in healing; it recurred very quickly, and a second operation was performed by Dr. Edward Martin, of Philadelphia, on January 2, 1896. Microscopical examination of the parts removed at the first operation showed it to be sarcoma. The palm of the hand was split open and the tumor found to consist of a thickening in the sheaths of the tendons; apparently the tumor was confined entirely to the sheaths of the tendons; the thickened sheaths were dissected out and the wound closed. The swelling, when Dr. Martin first saw it, was the size of a half dollar, irregular, indurated, slightly raised, and attached to the tendon. Microscopical examination of the tissues removed showed it to be a spindle-celled sarcoma.

Examination on February 15, 1896, showed in the centre of the palm of the right hand a cicatrix 2½ inches long; underneath this was a mass extending the entire length of the cicatrix, one and one-half inches wide at the centre, attached to the skin, and apparently to the tendons, but not fixed to the bony structures; the outline was not well defined. Just above the wrist, along the flexor tendons, was another small mass, about 1 inch in diameter and slightly raised above the surrounding parts. Injections of the mixed toxins of erysipelas and bacillus prodigiosus, filtrate, were begun on the 15th of February, 1896, 2 minims being given, followed by slight headache; no febrile reaction. On February 16th, 1 minim of the unfiltered toxins was given; temperature 100½°; slight headache. February 18th, 1½ minims of the unfiltered toxins were given, producing a chill lasting half an hour; temperature 101½°; good deal of headache. On the 19th 1½ minims of the unfiltered toxin caused a very severe chill, beginning half an hour after injection; temperature rose to 103°; pulse 160; very severe headache, feeling of bursting of vessels in the head. On the 21st 2 minims of the filtrate were given.

Examination on February 21st showed the mass in palm of the hand very much smaller and much more movable; mass in the wrist has also diminished in size. No local inflammation at the point of injections.

The injections were continued, usually daily, until March 30th. The mass in the palm of the hand had nearly disappeared; the fingers could then be straightened voluntarily; when treatment was begun the fingers could not be extended beyond 120 degrees. The gland in the region of the epicondyle was hardly perceptible. During the last two weeks the injections were made in the arm entirely, a filtered solution of the mixed toxins being used, and the largest dose being 20 minims.

The treatment was continued for six weeks by the patient's brother, a physician, all the injections being made in the arm. Examination, May 15, 1896, showed the tumor had entirely disappeared and she was able perfectly to extend fingers. She was presented to the New York Surgical Society, May 27, 1896.

CASE XVI. *Probable sarcoma of sacrum; entire disappearance; well one year later.*—H. B. H., male, thirty-eight years of age; born in Ireland and lived in the United States twenty years. Family history good; personal history: always well. In February, 1895, he began to lose flesh and strength, and soon after began to have pain in the lower part of the spine over the region of the sacrum; a little later pain began to shoot down the legs, more marked upon the right; consulted Dr. W. C. Deming, of Westchester, on April 1, 1895. At that time he was beginning to be slightly lame in the right leg; soon after some lameness appeared in the left leg as well. All these symptoms progressively increased; pain was very acute, so much so that the patient expressed a wish to die. On the 2d of May he was sent by Dr. Deming to St. Luke's Hospital. His normal weight of 175 pounds had fallen to 134 pounds. He was so lame that it took him more than one hour to walk from Forty-second to Fifty-fourth Street (a little more than half a mile). He was admitted to Dr. Francis P. Kinnicutt's service, who, on careful examination of the rectum, found a tumor attached to the anterior portion of the sacrum, the lower border of which could be reached with the index finger; the tumor was of firm consistence and fixed to the sacrum; extent of the tumor upward could not be determined as it was inaccessible. The patient was emaciated and his general appearance was very suggestive of malignant disease. The diagnosis of Dr. Kinnicutt and the other physicians and surgeons who saw him in consultation was: inoperable sarcoma.

On May 10th I was asked to see the patient in consultation with Dr. Kinnicutt, and the conditions found were such as above described; my diagnosis was the same as Dr. Kinnicutt's. I advised a trial of the toxins for two or three weeks, but if no improvement should be noticed by that time I advised discontinuance of the treatment. The injections with the mixed unfiltered toxins were begun at once, and made into the buttocks; the treatment was repeated daily and at the end of one week the pain had almost entirely subsided and the lameness had markedly improved The treatment was carried out at St Luke's Hospital for six weeks; at the end of that time the improvement was so great that the patient returned to his home and on the last of June resumed his work. The injections were continued by Dr. Deming two to three times a week, and were given in the evening and did not interfere at all with his usual occupation. By the end of June—seven weeks after the treatment had begun—the patient had gained 28 pounds in weight, and stated that he felt as well as ever.

Examination on March 8, 1896, shows the patient apparently in perfect physical health; he has no lameness whatever and no trace of his tumor can be detected on rectal examination. His present weight is 175 pounds. He has had no treatment for several months.

The report of this case I owe to the courtesy of Dr. Kinnicutt and Dr. Deming, for although the treatment was carried out under my direction I did not personally have charge of the case.

CASE XVII. *Fibro-angioma of the upper lip.*—J. T., born in Germany, aged thirty-two years; occupation farmer. Was operated upon in Chicago, by Dr. Andrews, in 1892, later by Dr. French, for present trouble. Family history absolutely negative. Since birth has had a thick upper lip, not growing much until twenty-one years old, when lip was thick as little finger and grew very slowly until four years ago, when it began to grow rapidly. Physical examination showed tumor size of a very large orange, involving the entire upper lip, being about nine inches from one corner of mouth to the other. Tumor pulsated synchronously with heart-beats, and was of same temperature as rest of body. It projected over lower lip to level with tip of chin.

Operation, November 4, 1895, by Dr. Robert T. Morris, of New York. Tumor transfixed with long, narrow scalpel, the handle being used as a hare-lip pin and a figure-of-eight gauze bandage thrown around same; greater part of tumor was then excised.

Two weeks after operation the condition of the patient was as follows: The whole base of the upper lip was occupied by a tumor one inch thick on the right side, extending upward 1¾ inches; on the left side the tumor was thinner, about ½ inch in thickness, and extending upward one inch. The toxins were begun the middle of November, 1895; injections were made into the dense tissue of the tumor about one inch from the lower border. The tumor immediately began to decrease in size and at the end of three weeks had almost entirely disappeared. Dr. Morris then performed a plastic to restore the lip, and in a letter recently received the patient states there has been no return of the disease. Microscopic examination of the tumor showed it to be a fibro-angioma.

CASE XVIII. *Tumor of sternum, tubercular; rapid degeneration under the toxins; disappearance; no return in one and one-half years.*—This case was fully reported January 19, 1895 (loc. cit.), but it is of sufficient importance to note here the subsequent history. The case was reported as a "probable sarcoma," although no positive diagnosis was made by Dr. Ferguson The tumor was firm in consistence, three inches in diameter, and occupied the upper third of the sternum. It was of four months' duration, and the patient had two sisters suffering from cancer. After one week's treatment the tumor had almost entirely broken down.

Sinuses persisted for several months, and examination of the discharge from the sinuses made by Dr. E. K. Dunham, pathologist to the New York Cancer Hospital, in January, 1895, showed the presence of tubercle bacilli, therefore proving the original tumor to have been probably tubercular in character.

It is of considerable interest to note that a second tumor of apparently similar nature in the left lumbar region, extending over upper part of ilium, underwent rapid degeneration during the injections of the toxins into the sternal tumor; but this was followed by a sinus that failed to close.

The curative influence of accidental erysipelas in *scrofula* was referred to at some length in a very important monograph entitled *Etude Clinique sur influences curative de l'Erysipèle dans la Syphilis*, by Charles Mauriac, published in Paris in 1873, nearly ten years before either the germ of erysipelas or that of tuberculosis had been discovered. Among the conclusions formulated by Mauriac we find this: "The curative influence of erysipelas exercises itself upon all these lesions however remote," showing that he clearly recognized both the local and systemic character of this peculiar action. Very recently Dr. Robert H. Green, of New York, has begun to investigate the action of the mixed toxins of erysipelas and bacillus prodigiosus.

*Erysipelas-serum.* The experiments with erysipelas antitoxic serum have, with one exception, been followed by negative or very slight results, and have been abandoned. A combined erysipelas and diphtheria antitoxic serum has been tried in two cases of carcinoma, but with little appreciable effect.

Continued experiments verify the opinion before expressed that the mixed unfiltered toxins of erysipelas and bacillus prodigiosus form the most effective preparation thus far used.

The investigations of Park[1] in diphtheria show that the amount of toxins in the filtrate is not more than one-half of the total amount contained in the liquid culture, and the same is probably true in erysipelas-cultures.

The value of the toxins depends entirely upon the virulence of the culture, and it is extremely difficult to keep the culture up to the requisite standard of virulence. This will explain in great measure the varying results.

Since the last paper, published over a year ago, there has been no change in the methods of preparing the toxins. Cultures have been made in bouillon containing varying quantities of peptone and of various degrees of acidity and alkalinity, but nothing has so far been found better than the ordinary neutral peptone-bouillon.

In preparing the serum the mixed unfiltered toxins were injected subcutaneously into a horse every two or three days for two months, beginning with 5 c.c. and running up to 100 to 120 c.c. As a rule, a rise of temperature of two or three degrees, lasting for several hours, would follow each injection, whilst locally there would be œdema and swelling without formation of pus, the swellings persisting for several days and appearing painful to the touch. The horse was finally bled from the external jugular vein and the serum prepared in the way recommended for diphtheria-antitoxin.

### *Successful Cases by Other Surgeons Employing this Method.*

CASE I.—Dr. Johnson's case of extensive spindle-celled sarcoma of the palate and fauces, extending down to the vocal cords, disappeared entirely under local injections of the mixed, filtered toxins. The case was published in full in the *New York Medical Record*, November 17, 1894. The patient is at present in perfect health, without recurrence, two and one-half years after treatment. The diagnosis of spindle-celled sarcoma was confirmed by microscopic examination. I saw the case in consultation with Dr. Johnson, and can bear witness to the hopeless, inoperable condition prior to treatment.

CASE II.—Dr. John E. Owens, attending surgeon, St. Luke's Hospital, Chicago, has sent me a very complete history of a case of sarcoma of the tibia, successfully treated with the toxins:

The patient, a boy, aged seven years, had received an injury to his leg in July, 1894. In December, 1894, a swelling appeared in the upper portion of the tibia. In March, 1895, exploratory operation was performed, showing a tumor involving the medullary canal. Microscopic examination was made by Dr. E. R. LeCount, of the department of pathology of the Rush Medical College. His report was asfollows:

"The pieces of tissue show that they were removed from a myeloid or giant-celled sarcoma, originating from the bone; they are very hemorrhagic, showing not only free hemorrhage into the sarcomatous tissue, but, also, large blood-spaces are very numerous. I should judge this to be a rapidly growing tumor; its malignancy is unquestioned."

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[1] Journal of Experimental Medicine, January, 1896.

Dr. Owens writes: "Before the use of the mixed toxins amputation above the knee would have been at once performed."

The treatment was begun on April 10, 1895, and continued until July 10, at intervals of one to two days. The affected leg had become almost normal in size; the difference in circumference of the two being only one-half inch.

Dr. Owens writes: "When the patient left the city I was led to the conclusion, from the favorable condition of the leg, that a recovery had taken place. At all events, I thought it best to discontinue the toxins and resume them should the limb again present an unfavorable appearance."

The patient was again seen on November 16, 1895, when the scar seemed somewhat elevated, although Dr. Owens did not think that the sarcoma had begun to reappear; further injections, however, were advised as a precaution, but the family decided against resuming the treatment.

In this case Dr. Owens's conclusions were as follows:

"When the treatment with the toxins was discontinued the patient had very much improved in general health; sleep, which before had been very much disturbed, was now all that could be desired. The leg presented a most favorable appearance. I felt gratified that a cure had been effected; and even if some recurrence had occurred, the further use of a remedy which had exercised such a powerful influence would, in my opinion, have brought the case to a successful issue."

CASE III. *Spindle-celled sarcoma of the calf of the leg; entire disappearance under twelve weeks' treatment with the mixed toxins.*—Dr. L. L. McArthur, attending surgeon, St. Luke's Hospital, Chicago, in connection with Dr. Owens, have sent me the following report:

The patient, female, aged forty years, without any family or previous history worthy of note, entered St. Luke's Hospital for the removal of a tumor of the leg. Operation revealed a tumor springing from the dense fascia covering the muscles of the calf. Although a very radical operation was performed, the patient was informed of a probable recurrence, and advised that, if any return were noted, to have an immediate amputation. She re-entered St. Luke's Hospital seven months later with a recurrence in the cicatrix and a tumor, the shape and size of half an egg, bulged from the calf of the leg. Having, in the meantime, tried the mixed toxins on another case, I determined to try them here, partly because the patient was three and one-half months pregnant. Treatment was continued for twelve weeks, with the result of a slow and steady disappearance of the tumor. Patient returned to the maternity ward seven months later; there had been no recurrence. Microscopic examination showed the growth to be a spindle-celled sarcoma.[1]

CASE IV. *Osteosarcoma of the lower end of the radius; three times recurrent; entire disappearance of the tumor under three months' treatment with the mixed toxins.* A second case reported by Dr. McArthur.

"The patient was admitted to the Michael Ress Hospital for recurrence in the cicatrix of a bony tumor, situated in the lower end of the right radius. The patient stated that the growth removed had been pronounced sarcoma by Dr. Christian Fenger, and amputation having been refused the tumor had been removed as thoroughly as possible. Three to four months later a recurrence followed, and he was reoperated upon by Dr. Wyllys Andrews, by the same method. The same diagnosis was made. Speedy recurrence followed. He then consulted Dr. D. A. K. Steele, who advised amputation of the arm. This the patient refused, and thereupon consulted me. I advised amputation, which was refused. I then agreed to try the toxins. After twelve weeks' treatment the growth had entirely disappeared. Three months later I presented the patient to the Chicago Medical Society for examination. I regret that no microscopic examination had been made in the case."

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[1] In April, 1896, Dr. McArthur writes me there is a slight suspicion of recurrence.

Case V. *Round-celled sarcoma of the orbit; marked improvement.*—Dr. McArthur has sent me notes of a third case worthy of brief mention.

A little girl, five and one-half years old, with large, round-celled sarcoma of the antrum of Highmore, extending into the nose, nasal pharynx forming a hard falx, producing extensive exophthalmus; cervical glands markedly enlarged, both anterior and posterior to the sternal mastoid muscle; she was brought to St. Luke's Hospital from Iowa. She had emaciated to thirty-seven pounds; was advised not to make the journey, as she would probably die on the train. She was brought to the hospital on a pillow in an almost moribund condition. After stimulants, tonics, and rectal feeding had been employed for three days, the administration of the toxins was begun; the injections were given every other day, and at the end of two weeks the patient was eating heartily, walking about, and riding on street cars, etc. There was a perceptible diminution in the exophthalmus. Believing I could aid the toxins, I removed the enlarged glands. Examination showed them to be typically sarcomatous. Three weeks later I removed the contents of the antrum, nasal cavity, extending back to the spino-maxillary fascia. The wounds healed primarily; cavity of the antrum was drained for six weeks. The patient was sent back to her home weighing sixty-nine pounds. She was advised to continue the treatment under the direction of her family physician. Getting very intense reactions, the physician discontinued the treatment. Recurrence followed not long after. Treatment was resumed with the result that she again began to improve. The improvement, however, did not continue, and two months later the patient died.

Case VI.—*A case of extensive inoperable intraperitoneal sarcoma* was successfully treated by Dr. Mynter, of Buffalo, and reported in full in the *New York Medical Record*, February, 1895.

Dr. Mynter writes me under date of May 21, 1896:

> "One of my assistants met the patient last week in excellent health; she had had no return of the disease, and you may safely report her as well to date."

The diagnosis of this case was confirmed by exploratory laparotomy and microscopical examination.

Case VII.—Dr. R. Tilly, of Chicago, under the direction of Dr. McArthur, treated a case of round-celled inoperable sarcoma of the orbit with the mixed toxins. The tumor entirely disappeared. The patient, a short time afterward, died suddenly, when apparently cured. There was no autopsy.

Case VIII.—Dr. Thomas F. Rumgold treated a case of eight times recurrent round-celled sarcoma of the breast, with the result of entire disappearance of the tumor. The patient died a few weeks later. Autopsy revealed extensive internal metastases. The case was reported as under treatment in an earlier paper.

Case IX.—Drs. R. M. Stone and C. C. Allison, of Omaha, Neb., have just sent me a complete history of a successful case of inoperable malignant tumor of the uterus. There was marked infiltration of the right broad ligament, and the disease was regarded as too far advanced for hysterectomy. The patient had lost fifteen pounds in weight. Cervix had been removed by operation. At the time when the toxins were begun the patient was suffering from repeated hemorrhages, and three surgeons who saw her in consultation regarded the case as absolutely hopeless. The toxins were begun on December 4, 1895, and given at first in the scapular region, and later in the tumor itself. Improvement was very marked and rapid. On January 29, 1896, the tumor had apparently disappeared and the patient was able to be up and about. She is, at the present time, in perfect health. A number of sections of the tumor were examined by Dr. W. R. Lavender, Professor of Pathology at the Omaha Medical College. Diagnosis of spindle-celled sarcoma was made.

This case will shortly be published in full by Dr. Stone.

Case X.—Dr. M. Storrs, of Hartford, Conn., has recently sent me a report of a case of large inoperable spindle-celled sarcoma of the axilla, which has entirely disappeared under four months' treatment with the toxins. The patient was seen in consultation by a number of surgeons, and the case was regarded as entirely inoperable and hopeless. Portions of the tumor were removed at three different times, and microscopic examination showed it to be a spindle-celled sarcoma. A section of the tumor has been examined by the pathologists of the New York Cancer Hospital, and also by Professor William Welch, of the Johns Hopkins Medical School, and the diagnosis was confirmed. This case is, of course, too recent to be looked upon as a cure, but the fact that this large, inoperable tumor, with a diagnosis of spindle-celled sarcoma demonstrated beyond question, has totally disappeared under no other treatment than the mixed toxins, must be regarded as strong evidence that these toxins exert a specific influence on such tumors.

CASE XI.—Dr. Sydney W. Wilcox[1] reports a case of myxosarcoma of the hand treated with the mixed toxins from June until August, 1895. The tumor nearly disappeared under the treatment. Dr. Wilcox states in a letter of April 10, 1896, that there has been no apparent return.

CASE XII.—Dr. J. Flippen, of Thomasville, N. C., has sent me notes of a case of rapidly recurrent sarcoma of the arm. The patient was a physician, seventy-four years of age. During one year he had undergone twenty operations, the tumor recurring after each operation with greater rapidity. When the toxins were begun the largest tumor was the size of a fist. After the injections had been given for two weeks this tumor had diminished to the size of a filbert, and the patient's general condition was markedly improved. At the time when the injections were begun he was confined to his bed; after two weeks' treatment he was able to go about and attend to his practice. He was told by other physicians that the injections were dangerous, and was advised to abandon the treatment. The disease remained quiescent for about three weeks, then the tumor began to increase in size rapidly. Amputation at the shoulder-joint was performed. Three to four weeks later the tumor recurred in the scapular region and quickly caused his death.

CASE XIII.—Czerny[2] gives his experience concerning the treatment of malignant tumors with the injections of the mixed toxins of erysipelas and bacillus prodigiosus in eight cases, four of which were sarcoma and four carcinoma. One case of inoperable round-celled sarcoma of the parotid was cured. It was a rapidly growing tumor of five months' history, occupying the entire region of the right parotid gland, extending back of the ear, and giving complete facial paralysis. The tumor was the size of a man's fist at the time when the treatment was begun. After eighteen injections had been given in the course of six weeks, the tumor had dwindled to three soft nodules, movable in the skin, and all measuring about one and a half by one-half inches. In a letter written May 20, 1896, Czerny states that he afterward excised the small portions of the tumor that remained, and the patient is at the present time quite well. This is the only case in which he has had complete success.

CASE XIV. *Carcinoma of the breast, with very marked improvement.*—Dr. George T. Howland, of Washington, D. C., had under his care a case of carcinoma of the breast, in which the treatment was partially successful. The patient, aged sixty-two years, had a typical carcinoma of the left breast, which was first noticed in September, 1894. In February, 1895, examination showed a tumor involving the major portion of the left breast, being six and one-half inches in the long diameter and four and one-half in the short. It was firmly adherent to the chest-wall; the skin was infiltrated and adherent; axillary glands were enlarged to the size of a hazelnut. A section of the tumor was removed with a Mixter punch for microscopical examination, which showed it to be a scirrhous carcinoma. The treatment with the toxins was begun February 10, 1895, and continued until May, 1895. On Februray 23, 1895, the tumor measured two and one-half by four and one-half inches, having decreased two inches in either direction. It had become freely movable upon the chest-wall. The axillary glands had decreased to the size of a hazelnut. In other words, the tumor had become easily operable, and operation was advised but refused by the patient. During May and June, within which time no injections were given, the tumor increased in size. The injections were again tried for a short time with little apparent effect. She continued to grow worse and died on the 22d of February, 1896.

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[1] North American Journal of Homœopathy, January, 1896.

[2] Muenchener medicinische Wochenschrift, September 3, 1895.

Dr. Howland's conclusions are: "That the toxins exerted a beneficial effect upon the growth, as proved by the measurements given; by the manner in which the tumor was released from its firm adhesions to the chest-wall; by the decrease in the size of the axillary glands; marked changes in consistency; and by the cessation of the pain."

CASES XV. and XVI. Very recently[1] Dr. Henry Matagne, of Bruxelles, has reported a case of cure of an epithelioma of the floor of the mouth. No microscopic examination was made, but the submaxillary glands were enlarged and the diagnosis was confirmed by several prominent physicians, who advised operation, but the patient refused to have an operation performed. The treatment was begun January 10, 1895, and lasted about three months. Dr. Matagne also reports a second successful case of recurrent sarcoma of the neck, the size of an egg, that totally disappeared under three and one-half months' treatment with the mixed toxins. Six months later there was a slight return. A third case of recurrent sarcoma of the neck the size of a fœtal head decreased two-thirds under three months' treatment with the toxins. The patient then consulted a surgeon. The operation proved fatal.

Dr. Matagne used the toxins in three other cases of sarcoma with slight effect, and also in eight cases of carcinoma with very little result.

It is quite true that most of the successes reported by other observers are as yet too recent to be fairly classed as cures, and such is not my object in presenting them. Whether they recur or not, they furnish the strongest possible evidence of the antagonistic and specific influence of the toxins upon inoperable sarcoma, and, in connection with my own cases that have passed the three-year limit, we have proof that such influence may be curative.

It would be hardly possible to expect the profession at large to accept without question or criticism such startling results as I have reported; hence I have related with some detail the successful results of others who have employed this method.

This series of upward of twenty cases of inoperable sarcoma, four of which have remained well for more than two and one-half years, the diagnosis in all of which has been established beyond question, according to the accepted methods of diagnosis, I believe to be sufficient to demonstrate that a real and positive step forward has been made in a field that, up to the present, has resisted every attempted advance of medical science.

I am conscious that there are men who will remain skeptical as to the value of the toxins *in spite* of the evidence here presented. They either fail to see any logical connection between the action of accidental erysipelas and the toxins, or they even go so far as to deny that there are any authentic cases of malignant tumors that were cured by accidental erysipelas. The only explanation they have to offer for these results, which cannot be questioned, is that in all of the successful cases there must have been an error of diagnosis.

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[1] Gazette Médicale de Liége, May 14, 1896.

Such an explanation might be entitled to some consideration were only a single case involved, but to propose it seriously as a satisfactory explanation of the result in twenty cases is, I believe, unworthy of anyone who claims to be guided by scientific principles. Much has been made of the spontaneous disappearance of tumors supposedly malignant. I have made a careful study of the reported cases of this kind, and have failed to find a *single* instance of a tumor disappearing spontaneously or after exploratory operation in which the diagnosis of sarcoma or carcinoma had been confirmed by microscopical examination.

On June 23, 1894, this subject was most thoroughly discussed before the Royal Medical and Chirurgical Society of London, when Greig Smith read a paper upon the "So-called Disappearance of Abdominal Tumors." At that discussion, Mr. Bland Sutton stated that he did not believe in the spontaneous disappearance of any connective tissue or cancerous growths, and the spontaneous disappearance of myomata which had been recorded as based on clinical observation alone. It would be somewhat remarkable that these cases I have reported should be the first and thus far the only ones with both clinical and microscopic diagnosis of malignancy to disappear spontaneously, and it would be more remarkable still that this disappearance should be coincident with the beginning of the treatment with the toxins.

It would be clearly unfair to rule out these cases on the ground of error in diagnosis, without ruling out the cases of cure following operations for sarcoma. Both have been subjected to the same standards of diagnosis, and the cases treated by the toxins have been subjected to more severe tests, inasmuch as in many of the cases the clinical and microscopical diagnoses were confirmed by a number of the best surgeons and pathologists.

Space will not permit entering into a discussion of the theories that have been advanced in explanation of the action of the toxins upon malignant tumors. I will merely say that I still adhere to the opinion expressed at some length in an earlier paper (1892, *loc. cit.*) that the micro-parasitic origin of malignant tumors furnishes the most rational ground for any satisfactory explanation of the action of the toxins.

The evidence in favor of this theory is steadily increasing, and I believe that in the near future it will amount to positive proof. If this theory be correct, it is quite possible that the unequal action of the toxins upon the different types of sarcoma may be due to slightly varying types of the organism that produces the tumor. The recent and most valuable researches of Dr. Thayer at the Johns Hopkins Hospital have shown that the different types of the malarial organism produce different types of disease, which are by no means uniform in their power of resisting the action of a specific remedy.

Metschnikoff,[1] in 1892, called attention to the close analogy existing between the parasite of malaria and the coccidia, and regarded it as significant that carcinoma should closely approximate the category of miasmatic affections, as proved by its endemic character.

The conclusions that I have drawn from a careful study of this series of cases may be briefly expressed as follows:

1. The mixed toxins of erysipelas and B. prodigiosus exercise an antagonistic and specific influence upon malignant tumors, which influence in a certain proportion of cases may be curative.
2. This influence is slight in most cases of carcinoma (including epithelioma); most marked in sarcoma, but varies with the different types, the spindle-celled form showing by far the greatest influence.
3. The action of the toxins is not merely local in character, but systemic.
4. The toxins should be used only in clearly inoperable cases, or after primary operation to prevent recurrence.
5. The results will vary greatly with the strength of the preparation, the most virulent cultures giving the best results.

I desire to express my very great obligations to Mr. B. H. Buxton, Director of the Loomis Laboratory and Assistant Pathologist to the New York Cancer Hospital, who has spent much valuable time in preparing the toxins. I am also much indebted to Dr. E K. Dunham, the Pathologist to the New York Cancer Hospital and Director of the Carnegie Laboratory, for the micro-photographs.

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# REMARKS ON THE BRUIT DE GALOP AND ITS CAUSATION.

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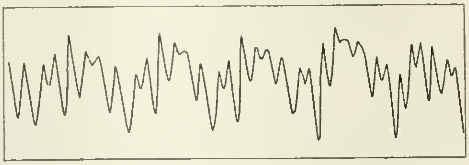
PATHOLOGIST TO THE BRISTOL ROYAL INFIRMARY.

MUCH interest surrounds most of the abnormal sounds heard over a diseased heart, but the majority of clinical observers possibly pass more or less lightly over the third sound which, interpolated between the normal first and second sounds, forms with them some variety of the bruit de galop.

The varied conditions under which it may appear and the many different characters it may assume seem entitled to give it a more prominent place among physical signs than it generally occupies. Perhaps one reason why many clinical observers merely note its presence without endeavoring to ascertain its significance is on account of its frequent transitory character. With others, again, the fact that they have no clear idea of its causation leads to lack of interest. They can give an explanation of the systolic or presystolic murmur, but not of the bruit de galop, so pass it by as unimportant. But while a definite explanation may be difficult, there can be no doubt that the bruit de galop or some variety of the triple sound occurs most frequently under conditions in which the muscle of the heart-wall suffers apart from valvular disease. Over hearts recovering from poisoning by toxins of diphtheria or typhoid fever, over dilated hearts also associated with interstitial nephritis, arteriosclerosis, excessive indulgence in alcohol or overwork, the bruit de galop is common, and it may also occur in cases of severe anæmia. In all such cases there is cardiac failure, due to impairment of power of the heart-muscle; but we naturally ask why should such weakness lead to the development of an interpolated third sound? It has been thought from its resemblance to an ordinary first sound to be due to asynchronous action of the two ventricles; in other words, it has been considered part of a reduplicated first sound. Most writers, however, strongly refute the idea of the possibility of such asynchronous action of the ventricles. But while this action may not be so impossible as the majority of writers have declared it to be, there is little evidence in favor of it as an explanation of the bruit de galop, and the fact that the abnormal sound frequently occurs without any reduplication of the second sound at the base would seem sufficient to negative such a view.

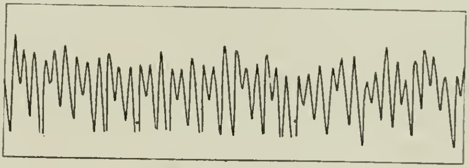
FIG. 1.



Tracing of heart impulse taken with Dudgeon's sphygmograph when a bruit de galop was present. Respiratory undulations are also present.

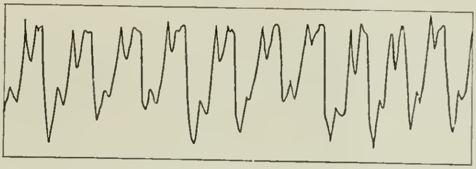
Yet some abnormality of cardiac action is obviously present, an abnormality that shows itself in the character of the cardiac impulse. The hand placed over the heart can, in the majority of cases, easily detect a rise preceding the ordinary impulse, and if the apex-beat is sufficiently forcible a cardiographic tracing gives marked evidence of the same abnormal rise. The following tracings illustrate this fact: the first (Fig. 1), taken from the impulse of a boy, aged fourteen years, with a large heart, associated with adherent pericardium, shows a high wave in the diastolic portion of the tracing. This is perhaps better shown in a tracing taken when the breath was held and the paper was running more slowly (Fig. 2). Both tracings were taken a few weeks before the boy's death, when a marked bruit de galop was present. Others taken several months previously, on former admissions to the hospital, show no such high abnormal wave in the diastolic portion (Figs. 3 and 4). The bruit de galop was not then present. Other tracings taken from the impulse of the dilated heart of a man, aged thirty years, who indulged freely in alcohol, show the same presence of a high diastolic wave with a bruit de galop.

FIG. 2.



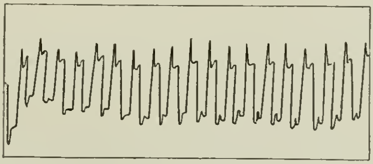
Tracing from the same heart; but breath held, and paper running more slowly.

FIG. 3.



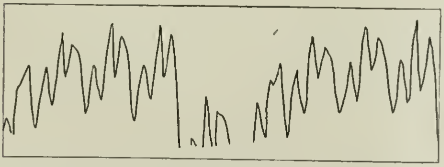
Tracing taken three months previously when no bruit de galop was present.

FIG. 4.



Tracing taken five months previously with Marey's cardiograph when no bruit de galop was present.

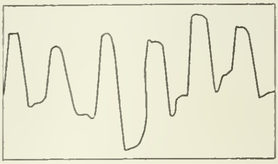
FIG 5.



Tracing taken with Dudgeon's sphygmograph from the impulse of a heart when a bruit de galop was present. The larger undulations are respiratory.

Fig. 5 was taken when a bruit de galop was well marked, and Fig. 6 five days previously, when no such abnormal sound was present. These tracings show the association of alteration in character of the cardiac impulse with the bruit de galop and confirm the experience of palpation that an abnormal rise precedes the ordinary normal upheaval due to systole of the ventricles. To what is this rise due? Potain and others have attributed it to distention of the left ventricle during inflow of blood from the contracting auricle. Distention of the ventricle by contraction of the auricle would explain the diastolic rise, but it is not obvious why that rise should be followed by a fall before the second rise due to systole of the ventricle occurs. One would suppose that the ventricle would remain distended and keep the chest-wall raised until the commencement of the ventricular systole, when a further rise would occur.

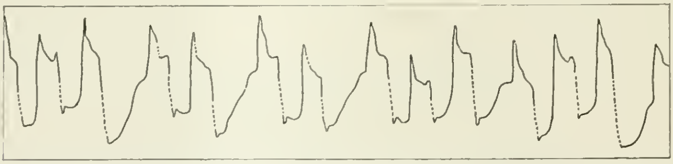
Fig. 6.



Tracing taken five days previously when no bruit de galop was present.

In other words, one would expect to see on a cardiographic tracing a ventricular systolic wave superimposed upon that due to auricular systole, and would not suppose that a deep negative wave would separate them. A glance at the accompanying figure may illustrate this point (Fig. 7).

Fig. 7.



Tracing taken from a heart-impulse with Marey's cardiograph, showing the rise of apex in diastole during intermissions.

It represents a tracing taken from over the heart of the boy already mentioned at a time when the pulse was intermitting, but no bruit de galop was present. During the prolonged diastole of the intermission the ventricle filled and raised the chest-wall, but when the diastole was of ordinary length the blood did not enter in sufficient quantity to produce such a rise. It is noteworthy, however, that the greater diastolic rise associated with the larger entry of blood during an intermission was not followed by a fall, and the tracing consequently shows a positive wave produced by this diastolic rise, with another smaller positive wave superimposed upon it due to systole of the ventricles, but there is no negative wave separating them.

The negative wave, which must indicate a temporary recession of the apex, appears, therefore, to be a marked feature of the bruit de galop and seems to indicate that some other factor, in addition to mere distention of the ventricles during systole of the auricles, must be at work in producing the abnormal impulse. Dr. Sansom[1] suggests that the inrushing blood first strikes the wall of the ventricle in the neighborhood of the apex, but that afterward a considerable quantity rebounds toward the base behind the great anterior mitral flap. It seems to the writer that some such movement of the blood may occur, but that the explanation given by Sansom is perhaps improbable. The entering blood will possibly in virtue of its inertia strike some regions of the ventricular wall more forcibly than others, but a large orifice with pliable edges like that of the mitral and its flaps is not likely to concentrate the force of fluid travelling through it. The blood will more probably be allowed to obey the laws of fluid-pressure and cause more or less uniform increase of tension within the cavity of the ventricle.

But while we believe that the auricular systole will not concentrate its force upon the region of the apex, it seems probable that this part of the heart-wall will be more exposed to the effect of increased intraventricular tension than other areas. A little consideration will show that the region of the apex is not protected in the way that the base is. In a dilated heart the chordæ tendineæ will be put on the stretch not only during systole of the ventricle, but also probaby during systole of the auricle. Most of these cords run diagonally inward and upward from each muscular pillar to be inserted in both mitral flaps, consequently outward pressure upon the flaps, while it widens the mitral orifice, will tend to draw inward the muscular pillars. These muscular pillars are more or less widely attached to the wall of the ventricle, and it follows that the tension of the entering blood will pull inward rather than force outward these areas of the heart-wall, and thus put a check upon its own distending force. The region of the apex, being the least protected, will tend to dilate most and the ventricle will possibly assume something of an ovoid shape.

That this distention of the region of the apex really occurs can be seen on examination of a dilated heart in the post-mortem room, and better still if the heart be stuffed, placed for a time in some hardening fluid, and afterward a portion of the heart-wall be cut away, the stuffing removed, and the cavity of the ventricle then examined. The bases of the musculi papillares, normally spreading their attachments nearly to the apex, will be comparatively high up on the wall of the ventricle, and the main enlargement of the cavity that has taken place will be seen to be situated below the bases of these pillars, in the region of the apex and lower part of the septum ventriculorum. We may, with some reason, assume that the dilatation in this region is largely due to strain put upon it during entering of blood from the auricle. The distention that produces this strain will, when palpable through the chest-wall, lead to the appearance of the high diastolic wave we have noticed in a cardio-graphic tracing. The negative wave that follows this high rise needs, however, to be explained. It has been mentioned that during systole of the auricle the mitral flaps are forced outward, and that this outward pushing of the flaps must, through the chordæ tendineæ, tend to draw inward the muscular pillars. The pressure of the inflowing blood will have one other effect. It will by its outward pressure upon the large mitral flap force that flap toward the septum ventriculorum and prevent blood in any quantity travelling upward past it toward the aortic orifice. This position of the large mitral flap and the comparative approximation of the musculi papillares tends, as we have seen, to throw the main distention upon the region of the apex and leads to a rise of the impulse during systole of the auricle. But when that systole is over there is no longer outward pressure upon the large mitral flap and no longer any restraint upon the musculi papillares; intraventricular blood-pressure is left to distend the heart as it will, which intraventricular pressure will cause rapid displacement of blood in the direction of the base, tending to throw the flaps together, and to fill the space between the large flap and the septum ventriculorum. This will cause diminution of blood in the region of the apex, and temporary recession of the impulse, leading to the production of a negative wave on a cardiographic tracing. The movement of the blood we have supposed to take place is the same as suggested by Sansom; but while Sansom attributes it to a rebound from the heart-wall, we have endeavored to show that changes in the position of intraventricular tension are the cause of the movement. We have been considering an abnormal cardiac movement that obviously exists, but it is the abnormal sound that attracts the attention of most observers. While, however, the causation of the ordinary heart-sounds still seems to be in some degree an unsettled question, one can hardly expect to be able to explain the bruit de galop, the abnormal feature of which is the presence of an added sound resembling a normal first sound. Potain believes this added sound to be due to distention of the wall of the ventricle by the auricular systole; Sansom, that it is due to sudden tension of the large mitral flap. Those who believe that the normal first sound of the heart is mainly muscular in origin may perhaps be inclined to accept the former view; those who think it originates in the mitral flap will adopt the latter.

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[1] Disease of Heart and Thoracic Aorta, p. 212.

In closing, I think it may be safely asserted that the triple sound occurs when the left ventricle, both ventricles, or sometimes it may be only the right ventricle, is more than normally distended during diastole. It is true that slight affections such as febrile disturbances in children may be sufficient to bring out a faint dull sound audible between the first and second sounds; but it is noteworthy that in such cases this sound frequently occurs only at the commencement of inspiration, when the ventricles must feel the negative intrathoracic pressure and tend to become more distended than at other periods of respiration, and it is reasonable to suppose that their muscular tone has been lowered by the fever, rendering them unable to cope with the distending forces.

Of the importance of this cardiac physical sign as regards prognosis, only those who have observed it carefully during long periods are perhaps able to express a definite opinion. That importance must, of course, depend largely upon the nature of the heart-failure with which it is associated.

In cases of hypertrophy of the heart without valvular disease the writer has seen the bruit de galop appear and disappear with little apparent alteration of general condition. On the other hand, it has been persistent for weeks and months until death has occurred, and in one instance was the only abnormal sign present where sudden death took place in a patient who was not considered seriously ill.

The fact that the bruit de galop may be sometimes transitory and of no great serious import, at other times permanent and apparently as much to be feared as the diastolic aortic murmurs, should, I think, give it an interesting if not an important place among abnormal cardiac sounds.

# THREE CASES OF ESSENTIAL ANÆMIA IN ONE FAMILY—FATHER AND TWO DAUGHTERS.

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and

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of Philadelphia.

The occurrence of a profound degree of anæmia in three members of one family—father and two daughters—with the development of symptoms of posterior spinal sclerosis and a fatal termination in one of the cases, would seem to be sufficient justification for detailing at length the history of this interesting group.

J. S., sixteen years old, who had for a time been a salesgirl in a store, presented herself at the Infirmary for Nervous Diseases, in the service of Dr. Wharton Sinkler, on October 28, 1895, when the following history was obtained:

Her father had died of locomotor ataxia and pernicious anæmia at the age of forty-five years. His history is hereto appended. The mother was living, about forty-five years of age, and was said to be also pallid and weak. On examination at a subsequent time she was found to be a young-looking woman, whose blood presented no abnormality. A younger brother was well. He proved to be a bright little fellow of five or six years of age, and his blood also showed no deviation from the normal. An older sister had had " weak spells," and had been under treatment at the Infirmary on account of pallor. A report of her illness is included in this paper. The patient herself had never been strong. She had had an attack of acute rheumatism when about five years old, and was at this time in bed for about two weeks. Menstruation first appeared at the age of fourteen years, but recurred with much irregularity, at intervals of four or five months. This function was attended with pain, but the discharge was pale—from its description almost serous—and scanty in amount. The last period had been five or six months previously. The girl had been accustomed to drinking two cups of tea and one cup of coffee daily. As a matter of fact, she admitted that she was unable to obtain an adequate amount, not only of nutritious food, but even of the bare necessities of life, and had been eating but little food.

According to the girl's statement, she had always been pale, although she had at no time observed an acute development or exacerbation. The degree of pallor, however, varied from time to time, somewhat in accordance with her nutritive supply. She improved upon a dietary of meat and milk, and grew worse when deprived of these. She had suffered considerable deprivation for a period of four or five years covering the illness, and the time subsequent to the death, of her father. She complained of excessive palpitation of the heart on exertion or excitement, with presternal pain. A sense of pain, weakness, and soreness was referred to the lumbar region of the spine. The girl always felt tired and was easily fatigued. She had noted staggering in walking and also in greater degree in standing. At times the fingers felt numb, and painful cramps appeared in the calves of the legs. She suffered from recurrent attacks of what she called "biliousness," characterized by impairment of appetite, coating of tongue, disagreeable and bitter taste, nausea, and pyrosis. Vomiting occurred rarely. There was moderate cough, with considerable expectoration, and the sputum was from time to time admixed with dark, clotted blood The patient had had an attack of diarrhœa two or three weeks before coming under observation, but this had not been repeated. There was no further history of hemorrhage or other abnormal discharge ; and there had never been observed subcutaneous extravasations of blood. A pin-prick would be followed by scanty escape of pale blood, almost serous. There was at various times a good deal of abdominal colic The bowels were, as a rule, obstinately constipated. There had been loss of flesh to the extent of nineteen pounds in a period of less than two months, although a gain of eleven pounds had been effected during the preceding summer in the course of a three weeks' stay in the country. There was shortness of breath on exertion and also frequent sighing. Chills occurred at irregular intervals—sometimes two or three in a night, at other times none at all—during a period of six months. These were often followed by a sense of overheating, with dyspnœa at times so intense as to cause a fear of death. There was no undue sweating. The feet did not swell. There was increased frequency of micturition both by day and by night, and the patient thought the amount of urine increased. For a long time there had been frontal headache, together with pain referred to the eyes.

Although the eyes were used but little, there was a feeling of weakness referred to them. Dr. A. G. Thomson examined the eyes and reported the absence of any lesion of the fundus. There was some vertigo. Sleep was poor, the patient being restless and wakeful. So far as the girl knew, she had always lived in dry, well-ventilated houses, and had resided in some six or seven different dwellings during the preceding seven years.

On inspection the girl appeared slender and rather small of stature, though not appreciably emaciated. Her complexion, however, was most striking and pronounced. The color was pale yellowish-brown, almost ashen, while the conjunctivæ were clear and white. The gait was fairly steady, withal a little debilitated. Station was perfectly steady, both with open and with closed eyes. The knee-jerks were active, extensive, and ready; ankle-clonus could not be elicited. The muscle-jerks in the upper extremities were active and vigorous. The action of the heart was rhythmic; the first sound was rather dull and heavy; at the left base a blowing systolic murmur could be heard over a limited area; the second sound of the heart was distinct; a hum could be heard in the neck from the gentle pressure of the stethoscope. The thyroid gland was full, but scarcely enlarged.

The blood was examined by Dr. J. R. Hunt, who made the following report:

The red corpuscles present much variation in size. Both macrocytes and microcytes are to be seen. Some cells show marked distortion of shape—poikilocytosis. The color of the corpuscles generally is pale; some of the smaller forms are dark tinted. The blood macroscopically is watery in consistency and the drop presents pale and red areas. Amœboid movement and a nucleated red corpuscle are observed (?). The erythrocytes number 3,000,000 to the cubic millimetre; the hæmoglobin-estimation is 20 per cent.

Tincture of ferric chloride, ten drops three times a day, was prescribed, and a few days later Blaud's pill of iron sulphate and potassium carbonate, each two and a half grains, was given.

The patient was admitted to the Infirmary on November 9, 1895, and was ordered Fowler's solution of potassium arsenite, five drops three times a day, to be increased at the rate of one drop three times a day. Full diet, including milk, beef juice, and eggs, was also ordered. Besides, gentle massage daily and general faradization were directed. Examination of the blood on December 17, 1895, showed the number of red corpuscles to be 3,936,000 to the cubic millimetre and the hæmoglobin-estimation 39 per cent. The patient improved markedly in color and flesh, but complained often of abdominal pain. She was discharged on January 28, 1896, looking quite like a different person. Her weight had increased from 86 to 94 pounds, and her color was bright and good. Unfortunately the last blood-reports have been mislaid, so that they cannot be cited, but judging from the general appearance of the patient the state of the blood could not have been far from normal.

The sister of the patient whose history has just been detailed, M. S., presented herself at the Infirmary on February 18, 1891, in the service of Dr. Morris J. Lewis, complaining of vertigo, referred more particularly to one side—*i. e.*, the right eye—together with a nervous sensation in the right ear. The erect posture induced nausea, with a feeling of weakness, so that the patient was unable to continue standing. The girl ate very little—rarely any breakfast. She was constipated and suffered from shortness of breath.

The patient dated all her trouble from an attack of influenza from which she had suffered nearly two months earlier. Menstruation was regular; the color of the flow was thought to be good; the discharge was sometimes profuse; the function was always attended with much pain; and there existed leucorrhœa. The breath was noted to be peculiarly cool. The heart was rapid in action and feeble in force. A hum was heard in the neck, as well as in the cardiac region, with a loud systolic murmur at the apex. The knee-jerk was normal on both sides. The patient presented an appearance of marked anæmia. The mucous membranes were very pale; the ears were waxy. Some fulness of the thyroid gland was appreciable. The skin presented a somewhat sallow appearance. There was slight pretibial œdema. There was no tenderness over the superficial bones. The lips were purplish in hue. The nails were white and flat, without curve. A large, irregular bronzed spot was present on the left breast; and the areola was very dark. The patient was in the habit of eating a good deal of fried food, much bread, and little meat. She was given Fowler's solution, three drops, with tincture of ferric chloride, twenty drops, three times a day, and under this treatment improved greatly in color and general appearance.

S. S., the father of the two patients whose history has already been related, applied for treatment at the Infirmary for Nervous Diseases, in the service of Dr. Wharton Sinkler, on January 12, 1891. He was at the time forty-one years old, and a laborer in the pumping department of the Philadelphia Gas works. He stated that his mother had died after a third paralytic seizure, while his father was still living and well. Three sisters also were living and healthy; two brothers had died in childhood; and one sister had died, it was believed, in consequence of some digestive disorder. There were no other children than those already referred to in this report. The wife had miscarried thrice: once between the birth of the first and second children, and twice between the birth of the second and third. The man had had "typhoid pneumonia" at the age of sixteen years, and again when twenty seven years old; and each time made a satisfactory recovery. Until two years before coming under observation, he had for eight years suffered from aggravated derangement of digestion, vomiting at least once and sometimes thrice daily, feeling well afterward, but suffering from pyrosis. In consequence he had learned to be careful in regard to food. He denied venereal infection; nor had he noted any cutaneous exanthem or suffered from sore throat or iritis. He smoked but seldom, although he chewed a good deal of tobacco. He used alcohol in moderation. About four years before presenting himself he had in wheeling a loaded barrow, which struck some object, felt as if something had given way in the small of the back. He had to be taken home and for a time was unable to straighten himself. He was put to bed and there remained for about two weeks, suffering no pain unless he moved his body, as in turning. The pain was distinctly localized to the small of the back. The patient seemed to recover perfectly and did harder work afterward than he had done previously.

The trouble for which the man presented himself had begun with a feeling of numbness in the legs about thirteen months before, in the sequence of mental depression due to loss of work; either coincidently or shortly afterward, numbness appeared also in the finger tips. At about the same time he noticed that he staggered in walking, especially at night, and that he could not control the movements of his legs; but he had never fallen. After a while vertigo was noticed on stooping, with a feeling on the part of the patient as if he were about to pitch forward. At times there was difficulty in buttoning the clothes and in picking up small objects. Walking upstairs occasioned great weakness and exhaustion. The patient had a feeling as if a band were fastened around the waist and the knee. There were no gastric crises and no pain in any part of the body. For a short time the patient had a feeling as if he were walking upon cotton. His general health was good. Considerable complaint was made of frontal headache. The memory was retentive. The eyesight had been failing for a year or more, the greatest trouble in the use of the eyes being experienced in reading at night; there had never been diplopia. The patient had for a period of nearly two months been as pale as when he first presented himself. The appetite was good. There was occasional flatulence after eating. Vomiting occurred only infrequently. The bowels were very costive. The functions of the sphincters were underanged. The patient was easily made short of breath. There was no palpitation of the heart. The feet had not been swollen except for about a week before the patient entered the Infirmary, when they, together with the face, became noticeably swollen. He arose usually once at night to urinate, and had so arisen for some time before his immediate trouble had begun. Sleep was not otherwise disturbed. Sexual desire had been lost for six months, and sexual power was also diminished. There had never been lancinating pains.

The patient was pale, presenting a somewhat muddy tint and waxy aspect. The mucous membranes also were very pale. There appeared to be little blood beneath the finger nails. The pupils were equal and slightly contracted and reacted well to light and in accommodation. There was no appreciable ocular palsy. Both optic disks were exceedingly white; the arteries and veins were intensely pale, the latter pulsating actively. The eyes were hyperopic and astigmatic. The tongue was protruded straight; its papillæ were poorly developed. The spleen was not enlarged. The pulse was quiet and regular, and the tension slightly increased. The first sound of the heart was blurred at the apex, but no distinct murmur could be heard. The gait was somewhat ataxic. Station was good until the eyes were closed, when swaying became quite marked. The grasp of the hand was only fair, but equal upon the two sides. Biceps jerk, triceps-jerk, and muscular irritability were normal and equal in the two upper extremities. The points of the æsthesiometer were differentiated at a distance of half an inch on the dorsum of the hands. The sense of touch was not delayed. Tactile sensibility was impaired on the legs. A feeble cremasteric reflex could be elicited upon the right, but none upon the left. The abdominal reflex could not be developed. The plantar reflexes were diminished. The knee-jerks could not be elicited, even with reinforcement. On the dorsum of the foot the two points of the æsthesiometer could not be differentiated at a distance shorter than three inches. There was prompt response to the touch of the points. The spine was straight and free from tenderness on percussion. Pressure upon the bones occasioned no pain. The patient was directed to take twenty drops of tincture of ferric chloride and five drops of Fowler's solution thrice daily, and on February 11, 1891, he was admitted to the hospital. The number of red corpuscles as determined at different counts by Dr. C. W. Burr was 2,350,000, 2,700,000, and 2,000,000 to the cubic millimetre, and the hæmoglobin-estimation 35 per cent., 27 per cent., and 30 per cent., respectively. The following additional observations of the state of the blood were made by Dr. Burr:

*March* 2, 1891. Red blood-corpuscles, 2,325,000; hæmoglobin, 35 per cent.

10*th*. Red blood-corpuscles, 4,125,000; hæmoglobin, 55 per cent.

17*th*. Red blood-corpuscles, 4,475,000; hæmoglobin, 60 per cent.

*April* 11*th*. Red blood corpuscles, 4,350,000; hæmoglobin, 80 per cent.

The note made on May 18, 1891, reads that the patient had returned to his heavy work in the gas-works. He still had some girdle sense and tightness about the waist, but no shooting-pains. The numbness of the feet and soles persisted. The knee-jerks were absent. The station was good. There were no vesical or gastric symptoms. Strychnin sulphate, one thirtieth of a grain thrice daily, was now prescribed.

On September 30, 1891, the hæmoglobin-estimation was 80 per cent., the number of red blood-corpuscles 3,750,000. On January 28, 1892, the hæmoglobin-estimation had fallen to 30 per cent., and the number of red cells to 2,300,000, without poikilocytosis and without increase of colorless cells. It was noted that the red blood-corpuscles varied but little in size. No nucleated red cells were observed.

In February, 1892, the patient went to bed on account of his anæmia, and he remained there for four months. Then he resumed work for three weeks, after which he suffered from a dysenteric condition for three months. Then he worked for another month. For three weeks at this time he had been at home. His difficulty in walking had grown gradually and slowly worse. He had suffered pain in lying on the right side. He was unable to read without glasses, though he had at no time diplopia. Girdle-sense persisted. At times there was dyspnœa. There was almost total inability to button the clothing. Numbness was still present in hands and feet. There was no vertigo. Cramps in the legs were present every morning. The appetite was good, the bowels constipated. Sleep was good. At times the feet became swollen. The gait was very ataxic and the hands had now also become ataxic. There had never been tinnitus aurium. Knee-jerks, elbow-jerks, and chin-jerks could not be elicited. Common sensibility was normal in the hands and there was no wasting. At this time the appearance of the patient was less waxy than at earlier observations. A basic systolic murmur could be heard on auscultation of the heart. The pupils were equal and reactive to light and accommodation. Blaud's pill, five grains, with Fowler's solution, three drops, was now given thrice daily. At the next examination of the blood the hæmoglobin-estimation was 55 per cent., and the red corpuscles had risen in number to 4,800,000 to the cubic millimetre.

The patient was readmitted to the hospital on November 4, 1892, in a markedly ataxic condition. His weight was 111½ pounds. There was no Argyll-Robertson pupil. The knee-jerks were still absent. The patient was put to bed and made a gradual gain in strength up to January 16, 1893, when he weighed 118½ pounds. On January 12th it was noted that the pupils reacted normally to light and in accommodation. There was now, however, partial atrophy of the optic disks, the more marked upon the left. The girdle-pain kept constantly ascending until it reached about the level of the nipples. On January 17, 1893, the patient had a chill, the temperature rising to 102.8°, but coming down to normal in the course of three days. Suspension was being tried. Coincidently it was found that the knee-jerks reappeared. The patient was discharged not improved on March 14, 1893, and died at his home on May 5th, in a " weak spell." An autopsy was held on May 8th, but the specimen of cord furnished for study was not in condition to permit of satisfactory histological examination.

The last case is of more than ordinary interest for several reasons. When the patient first came under observation he was regarded as a case of locomotor ataxia of somewhat irregular type. The absence of true fulgurating pains and of ocular symptoms showed, however, that it did not belong to the ordinary form of tabes. It seemed probable that the symptoms of disease of the posterior columns of the cord were due to the pernicious anæmia that was present, and this view was supported by the fact that when the patient's general condition markedly improved the tabetic symptoms all changed for the better. When the man was first treated in the hospital there was unusally rapid improvement in the state of the blood, and considerable increase in weight took place. At the same time the disorder of the muscular functions persisted. There were absence of the knee-jerks and unsteadiness in gait. The patient was, however, as stated in the notes, able to return to work and performed the duties of a laborer for several months. Another point of interest in the case is the fact that during the last period of hospital treatment after suspension, which was employed according to the method used in the treatment of locomotor ataxia, there was a return of the knee-jerks.

A number of cases presenting lesions of the spinal cord in conjunction with pernicious anæmia have been placed on record since Lichtheim[1] announced the results of his investigations upon this subject. Burr[2] has detailed seven cases, in only one of which was the cord found normal. He states that the only parts of the cord affected are the posterior columns, the lateral columns in and near the crossed pyramidal tracts, and occasionally the direct cerebellar tracts.

Many of the symptoms present in all three of the cases are suggestive of a gastro-intestinal origin for the anæmia, as the general condition, including the state of the blood, varied directly as the nutritive condition. Whether the spinal changes occasionally associated with profound degrees of anæmia—and symptoms of which were so prominent a feature of the fatal case detailed—are to be attributed directly to the anæmia or to some intoxicant perhaps equally responsible for the anæmia, has not yet been determined ; yet it would appear that some such relationship must exist. It may reasonably be admitted, further, that so-called pernicious anæmia may result from a variety of causes in whose train blood destruction is in excess of blood regeneration.

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[1] Congress für innere Medicine, 1887.

[2] University Medical Magazine, April, 1895.

# THE ACTION OF HYDROBROMATE OF SCOPOLAMINE UPON THE IRIS AND CILIARY MUSCLE.

By Charles A. Oliver, A.M., M.D.,
ATTENDING SURGEON TO WILLS EYE HOSPITAL: OPHTHALMIC SURGEON TO THE PHILADELPHIA HOSPITAL; CORRESPONDING MEMBER TO THE DETROIT MEDICAL AND LIBRARY ASSOCIATION.

This special series of experiments, which were conducted upon a great number of young, slightly hyperopic eyes that showed but little or no muscular strain and but slight chorio-retinal irritation, are here offered simply as a contribution to the question of choice of cyclopegics in the careful and correct determination of ametropia; reserving the action of the drug in different amounts upon inflamed ocular tissue to a later and more extended communication.

In this work care has been taken to make these studies under as near the same conditions as possible. Each subject, who was a person of intelligence, was seated in such a manner, with his back to a window with northern exposure, as to place his eye before a well-lighted page of cleanly cut and distinct type that was devoid of any context. One eye was tried at a time, the other being carefully excluded from all participation by several turns of a roller bandage. The exact horizontal width of the pupil, if it were round, or the length of its longer diameter, if it were oval, was carefully obtained. The utmost strength of the power of the ciliary muscles was next gotten in millimeter lengths.

One instillation of a perfectly fresh solution of a neutral specimen of the drug was now made. Notes as to the pupillary dilatation and the recession of the near point[1] were taken every two minutes for varying periods of time averaging from sixty to ninety minutes.

The moment that the half-dioptre type could not be recognized a convex lens of four-dioptres' strength was placed at about fifteen millimeters in front of the eye, care being taken in every instance to include it and its position as regards the nodal point of the eye in all of the ultimate calculations.

The accompanying chart, which is based upon those of Donders, is practically the same as that previously employed by the writer in other similar studies.[2]

*Observations.* 1. The mydriasis of a single instillation of the one-four-hundred-and-eightieth of a grain of hydrobromate of scopolamine is obtained in eighteen minutes.

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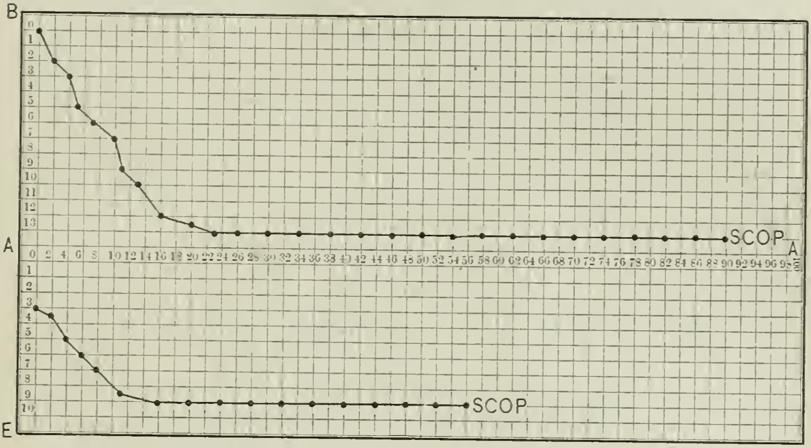
[1] In all of the estimations care was taken to obtain the exact equivalent refractive error before any of the tables were constructed and any of the data were formulated.

[2] Vide articles upon "The Comparative Action of Hydrobromate of Homatropine and of Sulphate of Atropine upon the Iris and Ciliary Muscle," and "The Comparative Action of Sulphate of Daturia and of Sulphate of Hyoscyamia upon the Iris and Ciliary Muscle," in the July, 1881, and July, 1882, numbers of this Journal.

2. The ciliary paralysis of a single instillation of the one-four-hundred-and-eightieth of a grain of hydrobromate of scopolamine is consummated in twenty-three minutes.

3. The single instillation of the one-four-hundred-and-eightieth of a grain of hydrobromate of scopolamine produces full dilatation of the pupil in every instance.

4. The dilatation of the pupil occasioned by the single instillation of the one-four-hundred-and-eightieth of a grain of hydrobromate of scopolamine remains *ad maximum* from twenty-four to thirty hours.



5. The total ciliary paralysis produced by the single instillation of the one-four-hundred-and-eightieth of a grain of hydrobromate of scopolamine is maintained from twenty-four to thirty-six hours.

6. By accurate observations made several times daily after the mydriasis and ciliary paralysis of the single instillation of the one-four-hundred-and-eightieth of a grain of hydrobromate of scopolamine are obtained it is found that the diameter of the pupil becomes normal in about seventy-two hours, and total re-establishment of the power of the ciliary muscle takes place in about ninety-six hours' time.

During the course of experiments with the drug it was noticed :

1. At the beginning of a few of the examinations there was a slight sense of conjunctival astringency which in a couple of instances amounted to a stinging sensation.

2. There were no appearances of constitutional disturbance ; care, however, having been taken in every instance to prevent the passage of any of the liquid into the lachrymal passages.

3. In no instance was any apparent increase of a choroidal disturbance produced by the employment of the drug used.

*Conclusions.* 1. The early and complete paralysis of the ciliary muscle that can be obtained by the single instillation of the one-four-hundred-and-eightieth of a grain of hydrobromate of scopolamine and the rapid and full return of the action of the muscle render this drug in this amount the most efficient and the most valuable cycloplegic that can be used for the proper determination of the total amount of ametropia.

2. The comparatively rapid return of the full dilatation of the pupil produced by the single instillation of the one-four-hundred-and-eightieth of a grain of hydrobromate of scopolamine to normal pupillary width renders the drug in this strength less objectionable than those drugs which by reason of necessarily greater strengths, to afford proper cycloplegic work, must be employed in amounts that give more permanent mydriasis.

3. The perfect freedom from injurious constitutional effects when the one-four-hundred-and-eightieth of a grain of hydrobromate of scopolamine is used renders the drug in this amount absolutely safe for employment in all cases in which total cycloplegia becomes necessary.[1]

# A CASE OF TUMOR OF THE CEREBELLUM IN WHICH OPERATION WAS REJECTED.

By James Hendrie Lloyd, A.M., M.D.,
NEUROLOGIST TO THE PHILADELPHIA HOSPITAL; PHYSICIAN TO THE METHODIST EPISCOPAL HOSPITAL AND TO THE HOME FOR CRIPPLED CHILDREN.

Tumors of the cerebellum, according to the statistics gathered by Mills and Lloyd, Starr, Gowers, and others, are among the most common of intracranial neoplasms. The proportion, in round numbers, appears to be about 25 per cent. They are especially frequent in children and young adults, in whom the prospects for long life should be, as a rule, the best. They are peculiarly disabling, entail extreme suffering, and, unless something can yet be devised for their relief, they are necessarily fatal. Their most common varieties are the tubercular and the gliomata and sarcomata, all of which are decidedly unfavorable, because, first, the tubercular form presupposes a constitutional infection; and, second, the gliomata and sarcomata belong to groups of neoplasms the members of which are likely to be recurrent and malignant. The causation of tumors of the cerebellum, just as of all other tumors of the brain, is usually obscure. The tubercular varieties are, of course, the results of systemic infection. The gliomata and sarcomata, however, occasionally appear to be due primarily to trauma. This, to be sure, is usually an obscure question, for the simple reason that injuries to the head, especially blows, are so common, that it is often possible to elicit a history of such an injury without at the same time it being possible for the observer to be certain that such an injury in a given case acted as the true exciting cause. In case, however, such a history can be established, especially if the injury has left a permanent external deformity of the bones of the skull over the region of the cerebellum, the indication and temptation for operation are greatly increased, and the case appeals strongly to the neurologist and surgeon to give the patient any possible chance that may arise from surgical interference.

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[1] The writer here desires to express his thanks to Drs. Paul Guilford and A. S. Wilson, late resident surgeons at Wills Eye Hospital, and to Dr. Louis H. Préfontaine, Resident Surgeon at the New York Eye and Ear Infirmary, for valuable assistance given during these experiments.

In some of the later experiments the real and the reputed strengths of the drug used were found to vary so much that no reliance could be placed upon the scientific results. Practically, with the drug as now daily employed by the author, the most certain results are obtained in some instances with the one-two-hundred-and-fortieth of a grain.

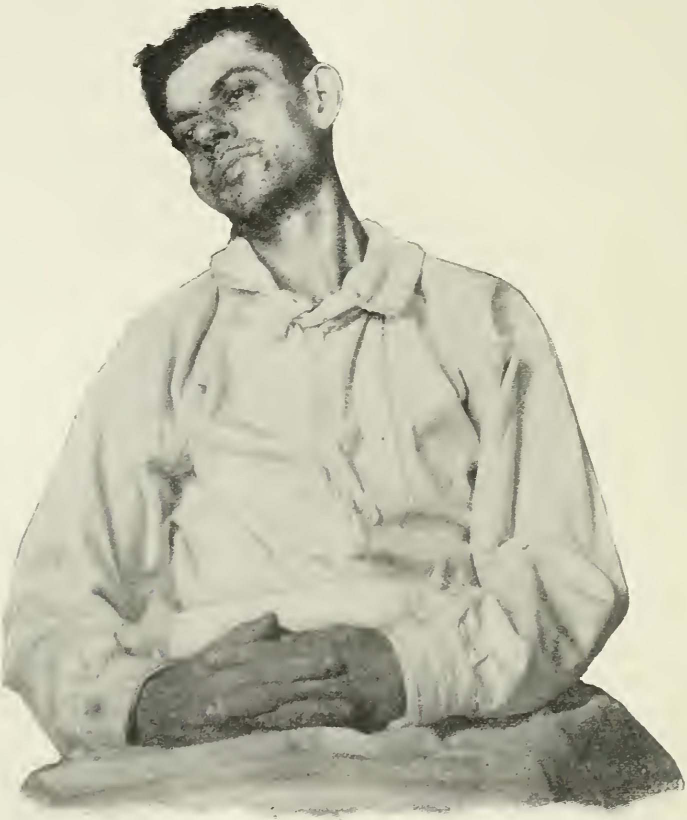
These considerations arose prominently in the case which I am about to report. The man had received a severe injury to the occipital bone several years before the onset of the symptoms of tumor. This injury had evidently caused a fracture of the external table, at least, and had left a very marked deformity. There was, however, a history of subsequent syphilitic infection. The symptoms pointed to a localization of the tumor at a possibly accessible point, and their onset was so recent at the time the patient first came under observation that it appeared probable that the growth had not made great progress. These facts led to the serious consideration of the advisability of operation; and finally, in consultation with my colleagues, Drs. Mills, Dercum, and Laplace, I had decided to have it done. The date had even been fixed for the operation when circumstances, not directly connected with the case, made it necessary to postpone the day. Before a second date had been fixed the patient's condition changed so much for the worse that, in view of the dangers and uncertainty of all operations beneath the tentorium, the operation was finally abandoned.

This history of the case is as follows:

A. L., aged thirty-eight years, white, male, married, a brass-polisher by trade. His family history was negative. The patient had had syphilis, but denied alcoholic habits. Seven years ago he was struck on the occiput by a fragment of a grindstone which had exploded. The extent of this injury and the duration of his disability from it could not be satisfactorily learned. He stated in general terms that he "soon recovered," but that ever since the accident he had been troubled with violent headaches, which were quite frequent. Five weeks before his admission into the hospital, in February, he began to have a violent shooting-pain, different from his headaches, but situated, like them, in the occipital region. He noticed then that his vision was failing He had also attacks of vertigo, but no vomiting, except once about one week before he came to the hospital.

Upon his admission in February, 1896, the patient was at once seen to have a characteristic cerebellar gait and attitude. His head and trunk were forced to one side (the right), even when he attempted to sit up in bed. (See Fig. 1.) When he attempted to walk, which he could do only when supported on either side, this forced attitude was still more marked. It seemed as though some power within the patient, not himself, forced his head and trunk to one side. At times, however, this attitude was not so obviously forced, although always to the very end he tended to assume this position when raised in bed.

FIG. 1.



Patient with forced attitude from tumor of the cerebellum.

The patient was almost completely blind, and had dilated pupils. He had a hesitating speech, and the slow cerebration not infrequently seen in cases of tumor of the brain; though rather more marked, in my experience, in cases of tumor of the frontal lobes than in other regions of the brain. The knee-jerks were exaggerated and a slight ankle-clonus, more marked on the left side, was noted. There was no anæsthesia, nor any paralysis of the arms or legs. When lying down the patient had good control of his legs. The muscles supplied by the fifth, sixth, seventh, ninth, and twelfth nerves were not paralyzed. There was no involvement of the bladder or rectum. The pain was not quite so urgent a symptom as it had been at the commencement. The patient slept and ate well. Vomiting at this time was not marked. There was no history of convulsions. The lungs, heart, and kidneys were normal.

After admission the patient's condition remained comparatively unchanged for some weeks.

The examination of the eyes was made with great care by Dr. Oliver, who reported as follows:

" Ophthalmoscopic examination shows that the pupil of the right eye is five by six millimetres in size, with its long axis at forty-five degrees. The media are clear. There is a marked choked disk, the extreme summit of which is situated down and in and extending forward into the vitreous to six dioptres' height from a two-dioptre fundus. The retina in the vicinity of the disk is swollen. The retinal veins are small and carry dark blood. The retinal arteries are very much reduced in size. The nerve-swelling appears very solid, white, and compact, and stands out in prominent contrast with the swollen retina. Between the macula and the disk and beneath the macula there are a few points of commencing degeneration.

" The pupil of the left eye is the same as that of the fellow-eye, except that its long axis is at one hundred degrees. The media are clear. There is a similar choking of the disk, the summit of the swelling extending seven dioptres into the vitreous from a two-dioptre level of the rest of the fundus. The disk is diffusely swollen, its edges being nowhere visible. The retinal veins are reduced in size except at the summit of the disk, at which place they are engorged with very dark blood. In this position the lower temporal vein curves directly into the substance of the disk and is surrounded by a congeries of fine swollen capillaries and minute capillary hemorrhages, distributed through which there are a number of brilliant crystalline masses. The retinal swelling is more extensive than it is in the other eye and gradually shelves down to the normal retinal plane far out in the periphery of the fundus.

" Vision in the right eye seems to be absolutely lost, while that of the left eye is reduced to the ability to see strong light-stimulus in a contracted and flattened field embracing the fixation-point.

" Careful examination of the irides shows that with the exception of a slight response of the left iris to very strong light-stimulus there is no reaction directly or consensually to light, accommodation, and convergence. The eyeballs are freely mobile in all directions, though when fixation is carried outwardly, either to the extreme right or to the extreme left, a series of horizontal oscillatory movements, that continue as long as the effort at fixation is maintained, are constantly induced."

On March 11th, about four weeks after admission, the man began to have incontinence of urine, apparently due largely to defective cerebration. He continued quiet and apathetic, lying on his back with his head somewhat retracted and deviated to the right. There was but little complaint of pain, even when the patient was roused and his attention called to the subject. A few days later he had several attacks of vomiting, but these were not persistent, and such attacks were never a conspicuous feature of the case.

During all the period of his illness in the hospital close observation failed to determine paralysis of the cranial motor nerves from the motor branch of the fifth down. The action of the seventh nerve especially was watched and tested, but at no time was the characteristic peripheral paralysis of this nerve observed. The acoustic nerve of one side (the right) was apparently dulled, but I regret that critical tests with the electric current could not be used for this nerve, because of the patient's mental condition. The muscles of swallowing, supplied by the glosso-pharyngeal or ninth nerve, and the muscles of the tongue, supplied by the twelfth, were never involved sufficiently to be notable. The patient's mental state rendered fine tests for some of these muscles difficult and unsatisfactory Still, the ability to swallow and to protrude the tongue remained good until the end. There was never any anæsthesia in the territory of the fifth nerve, nor on the trunk or extremities.

As the case progressed, during March, the patient became more stupid. He had headache, which was not constant. He answered questions, but slowly and vaguely.

The advisability of operation was discussed with Dr. Laplace, surgeon to the hospital, and later with Dr. Mills and Dr. Dercum. The diagnosis of a cerebellar lesion could not be doubtful, and the indications were all in favor of its being a tumor. The localization was approximately indicated by the forced movement; the tumor was near or in one of the middle cerebellar peduncles—but which one was not certainly indicated. The exemption of the seventh and ninth nerves rather pointed to the growth being remote from the under surface of the cerebellum—and, in fact, my fear was that it was within the fourth ventricle, where most of these tumors that have occurred in my experience have been. The exemption of these nerves was one of the chief reasons for this fear. None of these considerations certainly could have led any one of us to advise operation; but there was one feature of the case that seemed to favor it. This was the injury to the skull. A quite prominent deformity to the right of the middle line was notable on the occipital bone. It seemed almost like an exostosis. It was this lesion, more, I think, than anything else, that led to the determination of making at least an exploratory incision and removing this portion of bone. As said already, however, this operation was at first necessarily postponed, and finally, and as it would seem fortunately, it was voluntarily abandoned.

The patient failed gradually, without further marked change in his special symptoms, until April 10th, when he passed into a stuporous condition, with labored respiration and œdema of the lungs, and died. He never had a convulsion.

The findings at the autopsy were as follows:

*Body.* Emaciated, but not to a marked degree.

*Lungs.* Old adhesions of the pleura. Some anthracosis.

*Heart.* Some hypertrophy of the left ventricle. Heart nearly completely covered by the lungs anteriorly.

*Spleen.* Small; capsule thickened.

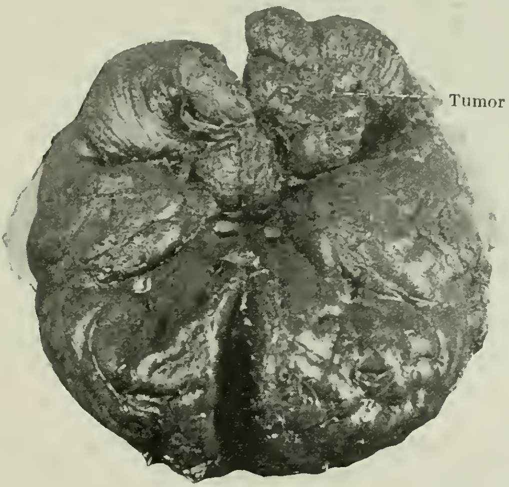
*Liver.* Normal.

*Kidneys.* Slight interstitial nephritis. Few small cysts found on the surface of the right kidney.

*Brain.* Calvarium of usual thickness; on the occipital bone to the right of the median line an exostosis is found, it being external, as the inner table is not affected. Membranes of the brain normal. No œdema. From the under surface of the cerebellum there is a neoplasm lying between the pons and medulla on the one hand, and the right lobe of the cerebellum on the other. Across its surface course several nerve-trunks, probably the seventh and eighth, stretched and atrophied, further back probably the fibres of the twelfth.

This tumor is oblong in shape, 5½ cm. in length, and 2½ cm. in breadth at the widest part. The growth[1] springs from the middle cerebellar peduncle. The posterior part of the tumor where it lies between the oblongata and the cerebellum is cystic. The anterior portion where it protrudes freely is solid. The under surface of the right cerebellar hemisphere is excavated apparently by pressure of the mass, and in the excavation there is a cyst formed by the membranes. Upon opening the fourth ventricle by cutting through the vermis, it is seen that the fourth ventricle is entirely clear, none of the neoplasm entering it. The tumor springs entirely from the under and external surface of the middle cerebellar peduncle. The corpora striata and optic thalami are normal. They are not enlarged, but they have not been opened because the specimen is to be kept for hardening and microscopic examination. The spinal cord shows œdema and degeneration of the lateral columns.

FIG. 2.



Tumor of the cerebellum.

*Analysis of Special Symptoms.* The high grade of optic neuritis seen in this case corresponds exactly to what is usually seen in all cases of tumor beneath the tentorium. This tumor was not in very close proximity to the anterior quadrigeminal bodies or to the optic tracts, and yet blindness was one of the earliest symptoms. This is probably explained in these cerebellar cases by pressure and obstruction of circulation and of the lymph-channels. It is noteworthy that there was almost complete ophthalmoplegia *interna*, but no ophthalmoplegia *externa*. As the nuclei for the internal muscles of the eye (the iris and ciliary muscles) are known to lie furthest anterior, beneath the Sylvian aqueduct, of all the nuclei for the oculomotor branches it seems rather odd that they should be more involved than these latter. Of course, this paralysis may have been due to the fact that the optic neuritis impaired the reflex arc.

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[1] The photograph of the brain in this case was made by Dr. C. Y. White, Resident Physician.

The proximity of the tumor to all the cranial nerves below the fifth and the exemption during life of all these nerves (except the eighth) are also noteworthy. It cannot be claimed for certain that none of them was involved, because the patient's condition did not admit of as exact tests as could be wished—but the trunks of the sixth and seventh on the right side, the latter of which lay apparently immediately across the growth, were certainly not paralyzed. The paralysis of the muscles supplied by these nerves is so conspicuous and unmistakable that it does not seem possible that such paralysis could have been overlooked in a patient so faithfully watched as this man was by all the attendants.

The inference is that these nerves, while still in the posterior cranial fossa, will endure more pressure and abuse than they will after they leave the fossa. This is probably because pressure does not so readily affect them there.

There were no variations in the knee-jerks in this patient such as are reported in some cases of tumor of the cerebellum. These variations, when they occur, are probably due to variations in pressure beneath the tentorium.

The absence of any direct connection between the old lesion of the occipital bone and the tumor is also noteworthy. As can be seen from the specimen, the tumor is quite remote from the part of the skull involved. The bone-injury had apparently been confined entirely to the external table; the inner table and the underlying membranes were absolutely normal.

The tumor is evidently a gliosarcoma which has undergone some cystic degeneration. It has no appearance whatever of being a gumma.

The forced movement, as seen in this case, while highly characteristic of a tumor near or involving the middle cerebellar peduncle, is of little localizing value for the surgeon. This is for the reason that the tumor may just as readily be on the ventricular aspect of the peduncle or even within one hemisphere of the cerebellum near the peduncle, as on the outside of the cerebellum. It does not seem certain, moreover, as yet, from these forced movements, which peduncle is involved. In the majority of cases the movement is *away* from the side of the lesion. In my case it was toward this side.

The question of surgical interference in cases of tumor of the cerebellum does not often arise, for the excellent reason that in all these cases such a proceeding must be largely experimental and most hazardous. In the case here reported it seems clear to me, in the light of the autopsy, that the result would inevitably have been fatal. The difficulty of localization sufficiently exact for surgical purposes must always be very great, and the technical difficulties, we may well suppose, will baffle the best and most self-possessed surgeon in most of these cases. In a recent case, Gerster,[1] of New York, attempted to remove a cerebellar tumor, which was afterward found post mortem to be in a position very similar to that of the tumor in my present case, but he was entirely unable even to get near to it. He made his incision through the skull above the attachment of the tentorium, along which runs the lateral sinus, intending to raise the occipital lobe and to reach the cerebellum through an incision in the tentorium; but he was prevented by the great pressure from within the posterior fossa and by an immense cerebral hernia. His patient died in two weeks.

## DIAGNOSIS OF CHRONIC ABSCESS OF THE BRAIN.

By J. T. Eskridge, M D.,
OF DENVER, COL.,
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(Concluded from page 190.)

The following case,[2] coming on after an attack of influenza, a possible cause of cerebral abscess, and presenting symptoms of meningitis, was due to an unsuspected vascular lesion which proved fatal:

J. N., aged thirty years, white, a boiler-maker by occupation, whose family and personal history was not obtainable, suffered from la grippe about four weeks before. He was greatly reduced by the attack, but no localized lesion was found. He had gradually recovered, so that he anticipated returning to work in a day or two, but he was still weak and languid. On the morning of the 17th of April, 1895, about thirty-six hours before I saw him, he awoke and was talking with his wife, when suddenly he put his hand to his head and cried, "Oh, my head!" Soon after this he lost consciousness, but he rallied in the course of a few hours and talked some during the day, but seemed dull and stupid and complained of pain in his head. The next morning he was nearly unconscious, but in the afternoon he was able to talk with his wife, and seemed rather bright. The temperature, Dr. Richmond reported, had appeared normal, although he had not registered it. When I entered the room, at 5 P.M., he observed and spoke to me, and said that his head was paining him. He looked depressed and appeared to be suffering. Pupils were small, but responded to light. The posterior cervical muscles were rigid and the head slightly retracted. After I had been in the room examining him for two or three minutes he became unconscious, and I found it impossible to arouse him The temperature was 98.3° F. in each axilla ; pulse 72 ; respiration 16. The knee-jerks were slightly increased. The ophthalmoscope showed no ocular change, and there was no evidence of paresis or paralysis of any muscles. The history of la grippe, the prolonged convalescence following it, and the sudden development of head-pains with normal temperature made me apprehensive of cerebral abscess, although no discharge was observed from either ear, and his wife stated that he had had no ear-trouble. On removing him to the County Hospital two hours later, his temperature was found to be 100.4° F. in the right axilla, 100.2° F. in the left, and 100.4° F. in the rectum. The rise in temperature was thought to be due to the disturbance caused by removing him to the hospital. He did not seem to be totally unconscious ; his eyes would follow me or the lamp around the room ; when asked his name he endeavored to give it, and succeeded in doing so in an indistinct manner. I asked Dr. Rogers, the attending surgeon at the hospital, to see him with me at 9 P.M. The temperature then registered 99° F. in the right axilla and 99.2° F. in the left ; pulse 60 ; respiration 16 ; retraction of the head was well marked, and on my attempting to bring the head forward, it seemed to give some pain. The diagnosis at this time seemed to rest between meningitis and cerebral abscess. The retracted condition of the head indicated irritation of the meninges in the posterior cerebral fossa, but the normal temperature at the time of my first visit, and its again descending after he had been resting a few hours in the hospital, seemed to militate against the presence of meningitis. That night his temperature was registered in each axilla every two hours, and the average temperature for the night was 98.4° F., being about the same in each axilla. At 9 o'clock the next morning the temperature in each axilla was 99° F.; pulse 64 ; respiration 18. He was becoming more stupid, pulse was occasionally irregular and respiration at times intermittent. At noon, when Dr. Rogers again saw him with me, his condition remained about the same as it had been during the morning, but we could find no indications for operative procedure. During the afternoon his temperature varied from 98.6° to 99.4° F. ; pulse 63 ; respiration 18. It was quite evident that there was pressure in the posterior fossa, especially around the pons and medulla. The low temperature contraindicated meningitis, although normal or subnormal temperature is sometimes observed in this disease. Abscess of the brain did not seem likely, as the temperature had been found constantly a little above normal most of the time for the twenty-four hours he had remained in the hospital. During the afternoon he seemed to be sinking into a deep comatose condition, and it was evident that life could not be prolonged many hours unless relief of pressure on the pons and medulla was effected by surgical means. I could be positive of but one thing, and that was pressure at the base of the brain in the posterior fossa. A button of bone was removed from the posterior cerebral fossa of this patient, and the parts irrigated for the relief of cerebral pressure, the patient subsequently dying.

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[1] AMERICAN JOURNAL OF THE MEDICAL SCIENCES, May, 1896.

[2] Irrigation of the Posterior Cerebral Fossa for the Relief of Basilar Meningitis. Journal of Nervous and Mental Disease, Nov. 1895.

*Autopsy* eleven hours after death by Dr. Leonard Freeman, pathologist to the hospital : The wound had healed without the formation of any pus, and no abnormal adhesions between the dura and the bone were detected. The external surface of the dura presented a healthy and glistening appearance. The pia over the convex surface exhibited no marked changes except engorgement of the veins. No clots were found in the venous sinuses. The arteries at the base of the brain presented evidences of disease in their walls, and in the main branch of the left middle cerebral artery, just before the cortical vessels are given off, a clot was found which blocked up the entire calibre of the vessel. In the centrum ovale of the left frontal lobe a considerable quantity of semi-fluid blood was found, which, after ploughing up and destroying a considerable portion of this part of the brain, ruptured into the lateral ventricle and filled the lateral, third and fourth ventricles. The corpora striata were softened A slight hemorrhagic extravasation was found in the right frontal lobe. The remainder of the brain presented a normal appearance. There was no evidence of any meningitis, nor of abscess. The pathological condition was one of hemorrhage into both frontal lobes, the greater in the left, the blood finding its way into the lateral ventricles, and filling these, together with the third and fourth ventricles.

The case just reported presented symptoms before death that were difficult to interpret. At the time of my first visit the normal temperature, dazed appearance, and retraction of the head, following a prolonged convalescence from an attack of la grippe, suggested the possibility of cerebral abscess complicated with cerebro-spinal meningitis. It may be thought that the sudden onset of the cerebral symptoms should have suggested cerebral hemorrhage; but we know how common it is for a cerebral abscess to be unsuspected until it ruptures into the ventricles, when the symptoms simulate those of hemorrhage into the cavities of the brain. A large hemorrhage into the ventricles is so commonly attended with a subnormal temperature at first, and a few hours later by a considerable rise of the temperature, that the case did not appear like one of cerebral hemorrhage. Further, the man's age was against the probability of hemorrhage. The subsequent history of the case after the patient was admitted into the nervous wards of the hospital soon made me give up all thoughts of a cerebral abscess and led me to regard it as a case of cerebro-spinal meningitis. The sudden loss of consciousness, followed an hour or two later by a return to a conscious condition, and after this consciousness and unconsciousness alternating one or more times, were difficult to explain before death.

The normal temperature at the time of my first visit may probably be explained by the irritating influence of the blood in the lateral ventricles counteracting the depressing effect of the hemorrhage into the anterior lobes of the brain. The condition of alternating consciousness, in the light of the post-mortem results, is probably explicable from the fact that hemorrhage first took place in the substance of the left anterior lobe, which probably gave rise to loss of consciousness. After reaction from this consciousness probably returned, and subsequently when the blood burst into the lateral ventricles, consciousness was again lost. As this process of filling the ventricles was evidently a gradual one, from the fact that depression was no greater, consciousness returned while this was going on, and it was not till the lateral ventricles became completely distended and the blood had found its way into the fourth ventricle that consciousness was finally lost.

Hemorrhage into the frontal lobes of the brain is of extremely rare occurrence, and hemorrhage in a man so young as the patient whose case has just been reported is extremely infrequent. A hemorrhage into the centrum ovale external to the great ganglion, and then bursting into the lateral ventricles, would have found its way so readily into the cavities of the brain as to overwhelm the vital forces of the patient and cause a profound shock, such as is commonly witnessed in ordinary intraventricular hemorrhage. The retraction of the head was due to blood in the fourth ventricle, and the serum of the blood which had found its way around the pons and medulla into the posterior fossa came from the blood in the fourth ventricle.

The case throughout its clinical history was a most puzzling one, and a positive diagnosis was not attempted. It was quite evident that there was irritation in the posterior fossa, and that in this portion of the brain pressure was increased; but beyond this I would not be positive, though the most likely thing that would account for it seemed to me at the time to be a basilar meningitis with exudation around the pons and medulla.

We meet with cases whose symptoms are apparently best explained by a vascular lesion, but at the autopsy an unsuspected cerebral abscess may be found, as occurred in a man whose history is as follows:

J. S., aged seventy-five years, white; widower for a number of years; born in Ireland; by occupation a laborer; of large physique; in Colorado since 1870, was admitted to the Arapahoe County Hospital, January 22, 1895. Family history, so far as I was able to learn, was unimportant. His health in childhood was good, and he had no serious illness until his seventieth year. He had indulged rather freely in alcohol, but during the last five years he had rarely drank. He denied syphilis, but suffered from gonorrhœa twenty years before. He received a bullet-wound in the left shoulder while in the army, in 1861. With the exception of the time during which he was disabled on account of the wound, he said that he was never sick a day in his life until twelve years ago, when he was kicked on the left shin. The injury to the left leg was followed by great pain, and later a large ulcer developed, which nearly healed at times, but for a number of years he had had a large open sore on this leg. One month before coming to the hospital, however, the ulcer completely healed, leaving a large dark-colored, rough cicatrix which was very tender to pressure. For some years he had suffered from vague rheumatoid pains in the legs, especially in the knees and ankles, and in the entire left leg he had had a feeling of numbness for about five years. This leg seemed to him awkward, but he was able to walk with the use of a cane. For a number of months there had been a partial inability to control the bladder; frequently he would soil the bedding and his clothes, and had to evacuate the bladder several times during the night. The patient said that he was struck over the lower portion of the back and nates by a cable-car early in January of the present year. He was able to rise and walk immediately after, and he did not think he had sustained much injury, although pressure over the lower portion of the back gave him considerable pain. Since the accident he had lost all control over the bladder, and the left leg had been very weak. The left arm, he had noticed, was weaker than the right. He had been obstinately constipated for a number of months. The condition of the right pupil, which was widely dilated and immobile, was the result of an injury which he had received eleven years ago to this eye.

*Examination, January* 22, 1895. He is unable to stand on account of the weakness of the left leg, and the examination has to be made while the patient is lying in bed. An old scar is observed on the anterior surface of both legs below the knees. They are evidently the result of old ulcerations. The arteries of the extremities are hard and unyielding. The left leg is very weak, but he can move this leg at all the joints, although the power is feeble and the movements are ataxic. The ankle-muscles of the left leg are weaker than those of the knee, and the latter are weaker than those of the hip. Muscular power seems to be fairly good in the right leg; the left arm is weaker than the right: Dyn. R., 100; L., 40. There is slight rigidity in the left arm, with tendency to hold the arm close to the side of the chest, and flexed at right-angles at the elbow. His mental condition seems feeble, concentration of his mind is very difficult, and it is almost impossible to keep his attention on one subject more than a few minutes at a time. There is considerable loss of sensation throughout the left side, apparently more pronounced in the arm and leg than in the face. The knee-jerks are present; the left slightly increased, while the right is less than normal. Plantar reflexes and tendo Achillis are present; ankle-clonus absent; cremaster and abdominal reflexes are absent. The external ocular muscles seem to act normally. The right eye is cataractous, the pupil being widely dilated and does not respond to light or accommodation. The left pupil is very small and does not respond to an active mydriatic, so that an examination of the fundus of either eye is impossible. There is apparent hemianopsia of the left eye; the fields could not be tested in the right eye on account of the presence of a cataract. The mental hebetude was too great to permit of an accurate examination of the special senses. The temperature is 98.2° F.; pulse 60; respiration 24. During the first week of his stay in the hospital his temperature varied from 98° to 99.2° F., usually being about 98.4° F. in the morning, and 98.8° to 99° F. in the evening; the pulse ranged from 54 to 90, only falling to 54 on one occasion, to 60 on three, and to 66 on two, the usual variation being from 72 to 88; respiration varied less than the pulse, ranging, except on two evenings, from 18 to 20. A record of the temperature, pulse, and respiration was made twice daily. During this week he gradually failed, both mentally and physically. He soon lost all continuity of thought, and his mind was a complete blank for any event of recent occurrence. He ate but little; he emaciated rapidly, and passed the discharges from the bladder and bowels into the bed. The second week, from January 29th to February 4th, there was a gradual failure. The temperature ranged between 98° and 99.4° F.; pulse between 60 and 80; respiration between 18 and 20. During the third week prostration increased rapidly, and his mind became a total blank. The temperature was a little lower than during the preceding week, rising above 98.4° F. only once, when it reached 100° F. one evening, but most frequently it registered 98° F. The pulse varied from 70 to 96, averaging about 80, and was weak and compressible; respiration ranged from 20 to 36. The rigidity of the left arm- and leg-muscles became more pronounced. On February 12th he passed into a deep comatose condition, and the muscular rigidity began to relax, and at 5 P.M. the temperature was 99° F.; pulse 100; respiration 24. The next morning at 7 o'clock the temperature had reached 101.4° F.; pulse 120; respiration 40; and at 5 P.M. the temperature was 105° F.; pulse 130; respiration 36. He died during the night.

*Autopsy.* The post-mortem examination was made about twenty hours after death by Dr. Leonard Freeman, pathologist to the hospital. The dead-room was cold and the body thoroughly frozen. Unfortunately, only the contents of the cranial cavity were examined. The adhesion of the dura to the bone was not abnormal. The membranes and cortical surface of the brain, neither on the convex nor on the basilar surface, showed any evidence of disease. The vessels were atheromatous, but not to a pronounced degree for one seventy-five years old. On sectioning the left cerebral hemisphere, no gross pathological changes were found, but in the right hemisphere an encapsulated cavity about two inches in diameter, containing a foreign substance presenting almost the identical appearance of orange water-ice, was found in the centrum ovale of the parieto-occipital region. The greater portion of the pathologic process had taken place in the occipital lobe. The lateral ventricle had not been broken into, but only a very thin partition of brain-substance intervened between the cavity and the posterior horn of this ventricle. None of the cortical substance of the brain had been directly involved by the foreign substance, which occupied a position so as to exert pressure on the right internal capsule. No evidence of gross disease was found in any other portion of the brain. In the frozen state it was impossible to determine whether the lesion was a cyst or an old abscess. On melting the icy contents of the cavity they presented the appearance of a watery straw-colored liquid, and seemed to be the result of a cyst; but the microscope showed numerous granular and broken-down pus-cells, proving the lesion to be a chronic abscess. There was no odor. After warming the brain the right hemisphere was found to be much softer than the left; but the extent of the ante-mortem softening could not be determined, as brain-substance softens so rapidly on warming it after it has been frozen.

Although I had an opportunity to study the above case for a period of three weeks, the presence of an abscess of the brain had not been suspected before death, and finding one at the autopsy was a great surprise to me. The age of the patient, the atheromatous condition of the radial arteries, and the comparatively sudden onset of the symptoms of cerebral softening, led me to suspect and to diagnosticate arterial thrombosis. The temperature was normal or nearly so, as is common to abscess or slow necrotic softening taking place after occlusion of a cerebral artery. I regret that I did not make a careful comparison of the temperature in each axilla. It is probable that the temperature would have been found higher on the paralyzed than on the unaffected side. In hemiplegia from necrotic softening it is likely that this difference of temperature in the two axillæ does not exist to a marked degree, and when present is not persistent, except possibly when the lesion causing the softening is an irritative one, as sometimes happens in acute softening from obstruction of large vessels. The history of a fall did not militate against thrombosis, as the head did not appear to have been injured at the time, and it is not infrequent for occlusion of a cerebral artery in the aged to be preceded by increased physical exertion, which may or may not be a determining factor in the final closure of a narrowed vessel. As it was impossible to obtain a view of the ocular fundi, the condition of the disks could not be ascertained. The absence of headache was in favor of a vascular lesion, and against abscess or tumor. In a man seventy-five years of age the sudden occurrence of a hemiplegic lesion, without headache preceding or following it, in the absence of a growth, or the history of one, in other portions of the body, the presence of tumor of the brain is not suspected. While no age is probably exempt from abscess of the brain, the infrequency with which it occurs in extreme old age made it improbable that I should meet with it in a man seventy-five years old. Of 223 cases of abscess of the brain tabulated by Gowers in his work on the *Diseases of the Nervous System* only one was found at the seventieth year or over. There was no discoverable cause for cerebral suppuration. There was no discharge from the ears, or history of any; the nose appeared to be free from infective material; and no evidence of purulent substance in the thoracic or abdominal cavity was detected during life. In reviewing the history of the case, after the autopsy revealed an abscess of the brain, it has occurred to me that the large open sore on the leg might have furnished infective material with which the brain-substance became infected. The ulcer had troubled him for a period of twelve years, but it had entirely healed, he said, a month before he came to the hospital. The appearance of the cicatrix indicated that the sore had been healed several months. As his memory for recent events was greatly impaired on his entering the hospital, it is probable that events that occurred months or years before appeared to his mind of a later date. This loss of time-sense is common in dementia, especially of the senile variety. We must remember that the left leg had appeared numb, weak, and awkward for a period of five years, and for a number of months he had lost partial control of the bladder. The capsule and its contents indicated that several months, at least, had elapsed since cerebral suppuration took place. What part the blow to the lower portion of the spine had to do with causing the abscess, it was impossible to say. No tenderness of this portion of the spine was detected at the time of my examination. If the blow occurred only two weeks before he entered the hospital, as he stated, it is quite evident that it played no part in the causation of the cerebral suppuration; but, as before stated, his time-sense for recent events was impaired, and no reliance could be placed upon his statements relating to time, especially for things of comparatively recent date. Had the diagnosis of cerebral abscess been made on the patient's admission to the nervous wards of the hospital I should have recommended and urged a surgical operation, as no hope could be entertained without the evacuation of the abscess, although the extreme age and prostration of the patient would have lessened the probability of recovery.

Not infrequently the history obtained from the patient is sufficiently inaccurate to be misleading. In such cases the corroborative testimony of the friends may aid in arriving at a correct diagnosis.

A man, aged about thirty years, came under my care a few months ago, and reported that he had been suffering from headache for two or three months. His habits had been dissipated; he had indulged in alcohol and venery to excess, and had contracted syphilis some years before. He gave no history of a fall, a blow to the head, otorrhœa, or injury of any kind. He had been treated for typhoid fever for a number of weeks previously to my seeing him, and had emaciated considerably. On examination I found the left arm and leg were weak, and that his mind was clouded. There was lessening of all sensory phenomena on the left side, and a complete left bilateral homonymous hemianopsia. The Wernicke pupil was absent. A few hours later he became stuporous, soon passed into a comatose condition, the left leg and arm became rigid, and the flexor muscles contracted. The left side of the face soon appeared paretic, and the tongue was protruded slightly to the left of the median line. He lived about three days and died in a comatose condition. The first two days his temperature was normal or subnormal; the pulse and respiration were exceedingly slow. The day of his death the temperature was quite high, reaching 104° to 105° F., and the pulse and respiration were frequent. With this history it seemed to me that the most probable condition was one of syphilitic growth in the brain, especially when taken in connection with the choked disk which was present in each eye, but the swelling was not extreme. Thrombosis of a cerebral artery was excluded on account of the presence of the optic neuritis, and nothing but the subnormal temperature and the peculiar rigidity suggested an abscess of the brain. The lesion was located in the centrum ovale, involving the occipito-sphenoidal region. After the patient's death, and before the autopsy was held, it was learned through his brother that some time preceding his fatal illness he had had a fall and struck upon the head; after this he was dizzy and suffered from headache for a time, and even after returning to work his head felt uncomfortable. With this additional history an abscess was made probable, and at the autopsy a large encapsulated abscess was found in the centrum ovale on the right side, involving the occipital and temporo-sphenoidal lobes. The whole of the right side of the brain was œdematous.

It is well known that trauma of the brain may excite into activity latent syphilis of the brain, and the diagnosis between abscess and syphilis of the brain may become a most difficult problem to solve in syphilitic subjects who suffer from an injury to the head. In this case the paresis of the left leg and arm when I first saw the patient, followed by the rigidity of the muscles, indicated an abscess rather than a tumor, as the rigidity denoted extensive softening, which is more common to the former than to the latter.

Some cases of brain-lesion may improve under antisyphilitic treatment for a number of months, and then relapse after the treatment is suspended, and again improve from the same treatment, and yet at the autopsy an abscess and not a tumor will be found.

A case of this kind came under my care more than a year ago. The patient was a man, a tailor by occupation, whose habits had been bad. He was a free drinker; had suffered several times from gonorrhœa, and had contracted a hard chancre about ten years before. He had never been the subject of traumatism. About eighteen months before I saw him he suffered from a severe cold, which was followed by purulent bronchial expectoration. Soon after this he began to complain of headache; his general health failed, he lost flesh and strength, and his mental power was lessened. On consulting a physician, because of his syphilitic history and head-pains, he was placed upon potassium iodide for a number of months; his headache decreased, but did not entirely disappear; he continued rather weak; appetite poor and vacillating; bowels constipated; and he was unequal to his work, both mentally and physically. He continued in this condition of impaired health for more than a year, when his headache again increased, mental confusion became greater, and he felt a sense of physical prostration almost continually. He slept poorly, became very much emaciated, and his headache at times was agonizing. He was again treated for syphilis of the brain, and again temporarily, but only slightly, improved in health. His condition became miserable, but he did not especially attract the attention of the remainder of the lodgers in the house where he was staying. After passing a restless night, he arose in the morning to dress himself, but before his toilet was completed he fell to the floor, and when found a few hours later he was mentally confused and unable to rise to his feet, the entire left side being almost completely paralyzed. When I saw him, a few hours later respiration was slightly stertorous; his temperature was about 1° F. subnormal in the right axilla, and one-half degree subnormal in the left; pulse 60, full and strong; respiration 12 per minute. On arousing him he seemed for a moment to appreciate what was said to him, but if left alone he almost immediately relapsed into an unconscious state. The left arm and leg were almost completely paralyzed, the paralysis being deeper in the leg than in the arm; the face did not seem to be affected. The tongue was protruded in the median line. No satisfactory test could be made of the general sensory phenomena on account of his blunted mental condition, but, so far as I was able to determine, sensation was less acute on the left side than on the right. The knee-jerks were increased, the left to a greater extent than the right; plantar reflexes were absent; ankle-clonus was slight on the right and well marked on the left side; cremaster and abdominal reflexes were barely perceptible on the right side, and absent on the left; pupils were equal in size, rather widely dilated, and reacted to light feebly; there was no paralysis or paresis of the external ocular muscles; both optic nerves were slightly atrophied, with some swelling of the disks; the choking of the disk was greater on the right side than on the left; there was apparent left bilateral homonymous hemianopsia, but it was difficult to test the visual fields accurately; the urine was free from albumin and sugar; the heart presented no evidence of disease; and mucous râles were heard in the lungs. No headache was complained of spontaneously, but on arousing him and asking him if he had any pain, he said "Yes," and pointed to his head. Stupor gradually deepened into coma, and he died a few hours later. At the autopsy an encapsulated, chronic abscess in the centrum ovale of the right side was found, involving the occipital and temporo-sphenoidal lobes. The pus was thick, greenish and offensive, and the entire right side of the brain presented an œdematous appearance. No pathological changes beside these were found in the brain. Permission was not obtained to examine any portion beside the head.

It is impossible to discuss the probabilities of arriving at a diagnosis soon after the formation of the abscess, which possibly dated back some fifteen or eighteen months before the patient's death, and about the time of the beginning of the head-symptoms, following a purulent discharge from the lungs. When I first saw the man, a few hours previous to his death, the diagnosis lay between a vascular lesion, tumor, and abscess. The eye-symptoms were sufficient to exclude a vascular lesion. The syphilitic history and the marked amelioration of symptoms from the use of potassium iodide pointed to a tumor of syphilitic nature; but the choked disks presented less swelling than is commonly observed in cases of progressive tumor of the brain. In the *Medical News* for March 10, 1894, I reported a case whose history was somewhat similar to that of this. In it the swelling of the optic disk was well marked and a tumor was diagnosticated, and the accuracy of the diagnosis was verified by the autopsy. In the present instance, notwithstanding the strong probabilities of a syphilitic growth, the history of a purulent bronchial discharge immediately preceding the development of cerebral symptoms, and the slight swelling of the optic disk, determined me to venture the diagnosis of a chronic abscess.

Quite recently I put on record the case[1] of a little girl who was referred to me by Dr. McNaught. She was eleven years of age; had suffered for a length of time from otorrhœa, suppuration in the groin, probably a psoas-abscess, and had sustained a severe injury to the head from a fall, all causes of cerebral abscess. She became the subject of epileptic seizures during which she did not lose consciousness; the convulsive attacks were attended with retraction of the head, at times with opisthotonos, tetanic rigidity of the arms, and frequently with shock-like movements of the arms. There was complete atrophy of the optic nerves, and no evidence of an exudate was apparent in the eyes when I saw her, which was several years after the head-symptoms first became manifest, and some time after blindness, almost complete, had developed. At the autopsy a large cyst, connected with a small tumor of the left lateral lobe of the cerebellum, was found. A more definite diagnosis than that of organic disease affecting portions of the brain in the posterior fossa was not ventured during life. The history of the seizures without loss of consciousness, talking and throwing the arms wildly around throughout the attack, with distinct clonic convulsive movements and opisthotonos, at first suggested hysteria; but this was easily excluded by the optic nerve atrophy and certain vascular changes in the fundi. If these had not been sufficient to enable me to diagnosticate an organic lesion, the attacks that I witnessed would have been ample evidence of such changes. The posterior neck-muscles were rigid as cords; the head was retracted, the spine arched backward, and the masseters, at times, were firmly contracted, so that when she attempted to speak her teeth, which she was unable to separate, were simply uncovered by the lips, and the arms, rigidly extended, were thrown wildly around, with shock-like convulsive movements. Three morbid processes were considered in the diagnosis, namely, abscess, tumor, and the results of an old basilar meningitis. The history of a bilateral otorrhœa with a very offensive discharge from the ears, occurring about the time of the commencement of her first symptoms, which were attended by a convulsion; the suppuration in the right groin, the origin of which could not, when I saw her, be determined, as there had never been any further evidence of caries of the spine; and the blow to the head received just previously to the convulsive seizures becoming frequent, from an etiological standpoint, were about as strong evidence in favor of cerebral suppuration as one expects to find. The subnormal temperature during the first few days of my observation of the case was in favor of chronic cerebral abscess. The otorrhœa had ceased for a period of nearly ten years, and during this time the child had never complained of pain in the ears. It seemed to me, then, that, if the little patient was suffering from abscess of the brain, the probabilities were against the ears having been the source of the septic poison, as even chronic abscess due to ear-infection rarely runs a very prolonged course. Headache is common to all the pathological processes under discussion. The optic nerve atrophy, without any swelling of the disks, was in favor of chronic meningitis and against the presence of a growth or abscess. I felt inclined to exclude intracranial suppuration, but I confessed to the physician with whom I saw the patient in consultation, that I had not sufficient reason to be positive in my opinion. Between meningitis and tumor I was unable to decide. One of these morbid processes would have accounted for some of the symptoms, while the second was necessary to explain the others. Almost total loss of sight, with optic nerve atrophy and seizures attended with opisthotonos, rigidity of the muscles, tonic extensive spasm of the extensors of the limbs, especially of the superior ones, and the shock-like movements of the arms, are found in meningitis of the posterior fossa when the surface of the pons is irritated. So far the symptoms and theory of meningitis harmonized, but I was at a loss to account for other cranial nerves than the optic escaping. That the child at times should feel quite well, and be entirely free from headache or any apparent discomfort, and that there should be no rigidity of the posterior neck-muscles, except during the paroxysms, seemed to me inconsistent with the theory of an old meningeal exudate in the posterior fossa. A tumor in the cerebellum so situated as to produce remittent pressure on the pons, with distinct paroxysms of increased pressure, is common to the experience of every one who has studied and observed persons suffering from cerebellar growths; but for the pressure-symptoms to be apparently completely intermittent, and to recur with as much regularity as epileptic seizures, without loss of consciousness or mental dulness, was new to me in my experience of cerebellar growths.

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[1] Tumor and Large Cyst of the Cerebellum, with Symptoms Extending over Several Years. Medical Record, August 17, 1895.

In the light of the autopsy, which revealed the presence of a large cyst and a small tumor in the posterior three-fourths of the left cerebellar hemisphere, are the symptoms explicable? It is possible, owing to the watery contents of the cyst, that the pressure exerted by the cyst after it became chronic, on the adjacent structures, was not so great as results from a more solid and unyielding tumor, so that, while there might have been a papillitis during the early stages of the growth, the lessened pressure after the formation of the cyst and the breaking down of the growth allowed this to subside with the resulting atrophy of the optic nerves, and time had permitted all intraocular exudate to be absorbed. We know that a growth in the cerebellum, from its effects upon the circulation of the veins of Galen and adjacent veins and sinuses, disturbs the function of the pons and medulla, usually to a slight extent, continuously, and, when it has reached sufficient size to exert pressure on the respiratory and neighboring centres, by paroxysms, threatening life by increased pressure, which probably results from temporary œdema of the parts. In the case of a cyst, with yielding contents which may vary in quantity from time to time, the pressure-symptoms probably may become intermittent. The peculiar tetanic spasms were most likely due to temporary irritation of the pons and medulla.

With the information gained from the clinical and pathological observations of this case, could error be prevented in the diagnosis of a somewhat similar one? If a large cyst of the cerebellum is attended with more varying pressure-symptoms than a tumor, a problematic diagnosis might be ventured, and it might, or might not, be correct. The only unilateral symptom in the case was the tendency of the right arm and leg to become a little more rigid than the left, with, at times, a turning of the head and eyes to the right; but this was inconstant and of little localizing value in determining which hemisphere of the cerebellum was affected. Had it been possible to localize accurately the lesions, the tumor, in all probability, could have been removed, the contents of the cyst evacuated, and the life of the patient saved. A careful study of the case just reported demonstrates how meagre and unsatisfactory are the symptoms, even of an extensive lesion in one lateral hemisphere of the cerebellum, and that ataxia from lesions of this portion of the brain probably only occurs when they are situated so as to exert pressure on the pons, usually through the medium of the middle lobe of the cerebellum.

It will be seen by a careful study of the cases that I have reported in this paper that, in the diagnosis of chronic cerebral abscess, while one must be careful to study every symptom, together with the apparent etiology, too much stress must not be laid upon either. Chronic otorrhœa, a blow to the head, and suppuration in a distant portion of the body, were found in one of my cases, yet the patient died from cyst and tumor of the brain. In another the symptoms were distinctly indicative of arterial thrombosis, yet the patient died of intracranial suppuration. Hitz observed a case in a man twenty-nine years of age who had suffered for sixteen years from otorrhœa, and had, besides, received a blow on the head, both being distinct causes of abscess, yet death occurred from tumor of the brain (*Lancet*, January 12, 1895, p. 82, Murri). One of Professor Murri's cases of abscess of the brain occurred in a man who had never received a blow or any apparent injury to the head, nor had been the subject of suppuration in distant portions of the body, nor had he suffered from any disease that is likely to cause cerebral abscess, yet death occurred, and the autopsy revealed intracranial suppuration. In another one of his cases there had been suppuration in the tissues which surround the bones of the cranium, suggesting that the organic brain disease was due to suppuration, yet the patient died from sarcoma and encephalic tuberculosis. And again, in another one, the symptoms and apparent etiology pointed to tubercular meningitis, but the patient succumbed to intracranial suppuration.

In the diagnosis of chronic abscess of the brain the morbid processes from which the suppuration must be differentiated are tubercular meningitis, softening, hemorrhage, and tumor.

TUBERCULAR MENINGITIS.—Theoretically it does not seem that there should be much danger of mistaking a cerebral abscess for meningitis; but theory fails, and preconceived opinions of the value of symptoms weaken in the stern reality of clinical facts and post-mortem results, not always because the theory is wrong or the opinions have been based on false premises. There is no portion of the human organism the destruction or irritation of whose tissues gives rise to so clear, invariable, and definite symptoms as that of certain portions of the brain when the lesion is limited and uncomplicated. Irritation of a given portion of the brain will be attended by the same symptoms, no matter how often the irritant is applied, provided the conditions and modifying circumstances are always the same; but the extent of pathological lesions varies, and the degree of irritation or the amount of loss of function from a similar lesion depends upon so many inscrutable causes, that no two cases will be attended by precisely the same symptoms. Besides, the results of irritation of a portion of the brain, whether it be due to meningitis, softening, hemorrhage, or tumor, may give rise to the same general character of symptoms that occur from the presence of an abscess. The majority of cases of tubercular meningitis, even in the adult, run their course in a few weeks, are attended by a febrile process, and present symptoms of cranial-nerve involvement. While these are the usual symptoms that serve to distinguish tubercular meningitis from chronic abscess of the brain, unfortunately for the diagnostician they often vary greatly. The duration of some cases of tubercular meningitis is longer than that of some cases of chronic cerebral abscess. I reported a case of tubercular meningitis, with continuous symptoms, in a child, to the College of Physicians of Philadelphia, in 1883, in which the disease extended over a period of more than eight months. In the same paper are collected numerous cases, in some of which the duration of the symptoms was a year or more from the time of the first evidence of tubercular disease of the brain to the death of patient (see *Transactions* for 1883). Professor Murri, in the *Lancet* of January 26, 1895, p. 206, reports a case in a man thirty-three years of age, who had suffered horribly from headache for a period of five months immediately preceding his death from tubercular meningitis. In this connection he says: "Kratmer refers to a case which lasted four months, and speaks of those of Leitz of forty-two and fifty-four days' duration; Gatti of Milan, observed one lasting seventy-nine days; and Dickinson noted one of eight months' duration." Rise of temperature is not always found in fatal tuberculosis of the cerebral membranes. It seems to me that we must make a distinction between tubercular meningitis and tuberculosis of the membranes unattended by inflammation. Two years ago I saw and studied with Dr. McLauthlin a case of tuberculosis of the meninges in a man about thirty years of age. He had been suffering from tuberculosis of the lungs for a number of years, and for several weeks before I saw him he had been depressed in spirits and experienced severe headache, but he had not been attended by any physician. During the week immediately preceding his death, covering the time during which he was seen by Dr. McLauthlin and myself, the temperature was slightly subnormal until a day or two before his death, when it registered from 97° to 100° F. At the autopsy the pia at the base of the brain, especially in the Sylvian fissures and over the optic chiasm, was studded with masses of tubercles, but the microscope showed no evidence of recent inflammation. In Murri's case, above referred to, and those of others in which inflammatory products were quite abundant, although probably not of recent date, the temperature was normal or subnormal for a period preceding death. Cranial-nerve symptoms are not invariable in basilar meningitis, and some cases of abscess of the brain are attended by irritation of the cranial nerves.

A condensed report of one of Professor Murri's cases (*Lancet,* January 26, 1895, p. 207) will illustrate this point:

A male, aged thirty-five years, was admitted to the clinic, August 16, 1890. He was in a state of delirium and some stupor. His wife stated that up to his present illness he had never suffered from illness. About two weeks before this, or in the beginning of August, he began to complain of headache, which became so intense that he could not leave his bed after August 7th. His strength gradually failed ; his mental condition from the beginning was abnormally irritable, and soon became dull. On the night of the 15th, a few hours before admission to the clinic, delirium and stupor first appeared. The patient seemed well nourished. Occasionally there would be muscular twitching, when he would give vent to cries of pain in his head. There was slight rise of temperature. Examination on admission to the clinic : Pupils were equal in size ; reacted slowly ; tongue deviated toward the left ; sensory phenomena everywhere dull ; spasms and contractions occurred in all the limbs ; pulse was 86 ; respiration 20 ; temperature does not seem to have been registered ; stupor was variable and spasms continued during sleep. Six days later the left pupil was dilated. On the next day, or the 23d of August, the muscles of the back of the neck were rigid and the head retracted ; there were ptosis of the right eye and deviation of the eyes and head to the right ; reflexes were normal everywhere ; general sensory phenomena continued obtuse ; smell was absent. On the 25th there was convergent strabismus of the left eye from weakness of the external rectus muscle, and the ball of this eye was painful ; the muscles of the left side of the face were weak, and he was unable to protrude the tongue. On the 27th the left leg and arm showed evidence of weakness, but muscular and posture senses were everywhere good ; the pulse was regular ; there was nystagmus of the left eye, and tonic spasm of the right arm with flexion of the forearm upon the arm and of the hand upon the forearm ; reflexes of cornea and pupil of the left eye weak and slow ; the right eye presented normal reflexes ; deglutition occurred with difficulty, owing to lessened reflex action of the pharynx ; the headache continued intense ; stupor deepened each day, and by September 12th the patient was absolutely comatose. The pulse at that time varied from 120 to 130, and breathing increased from 24 to 28, and the temperature reached and went above 100.2° F. on several occasions. He was almost always feverish, with the exception of two periods, from August 25th to 29th, and from September 3d to 11th, during which times the temperature remained at 96.6° F. Death occurred on the 14th of September. At the autopsy all the meninges presented a normal appearance. There were three abscesses ; one pinhead in size, on the anterior right side of the pons in the vicinity of the nucleus of the sixth nerve ; another, small, in the anterior part of the left temporo-sphenoidal lobe ; a third and largest, occupied part of the right optic thalamus, internal capsule, and lenticular nucleus ; the lateral ventricle was not broken into. The abscess was rather large and completely encapsulated, and contained inodorous, greenish pus. The parts around the large abscess, including the cranial nerves, were greatly compressed.

This case presented the typical cranial-nerve symptoms so commonly witnessed in tubercular meningitis, and as no cause could be found that would have made one suspect intracranial suppuration, the diagnosis must have been difficult, if not impossible.

It will be seen that the ease with which tubercular meningitis and chronic abscess of the brain may be mistaken for each other is much greater than what at first sight would appear. It is less difficult to point out the dangers of mistakes in diagnosis than to lay down rules by which they may be avoided, but the more we are on our guard the less likely will we be to commit unpardonable blunders.

Cerebral Softening and Focal Encephalitis. I am not aware that any one, either in journal articles or text-books, has pointed out the danger of mistaking cerebral softening from thrombosis of a cerebral artery for chronic abscess of the brain. Professor Murri reports a case, in the person of a girl, seventeen years of age, of grave chlorosis with chlorotic thrombosis of the lateral sinus and of the cerebral veins. This distinguished observer had made the diagnosis of "Chronic abscess of the left temporal lobe," and from a careful study of the clinical symptoms it is difficult to see how this mistake could be prevented in a similar case. It was not until recently, when I encountered a case of focal encephalitis, due to thrombosis of an artery, in a young man who presented symptoms which simulated those of abscess, that my attention was called to it. This case is reported at some length in this paper.

About twelve years ago, while practising in Philadelphia, I was engaged in an elaborate series of observations of the temperature of each side of the body in cerebral lesions, and on the surface-temperature of the head and body in health and disease; but the development of pulmonary tuberculosis in my own person compelled me to abandon the work for a number of years. During the past two years I have resumed the study of the comparative temperature on each side of the body in cerebral lesions, and within the past six months, with the kind and intelligent assistance of trained nurses, both in the St. Luke's and Arapahoe County Hospitals, I have made numerous and interesting observations along this line. It is premature as yet to undertake to arrive at definite conclusions, but the following provisional statements may be made: In paralysis from brain-lesions the temperature on the paralyzed side is equal to or greater than on the unaffected side, when the lesion in the brain is an irritative one; but less on the paralyzed side when the brain-lesion is a destructive, non-irritating one. In cases of hemiplegia from cerebral hemorrhage the temperature on the paralyzed side is lower than on the opposite side during the stage of depression immediately following the hemorrhage; but as soon as reaction has become well established the temperature rises on the paralyzed side to a point about half a degree to a degree Fahrenheit higher than it does on the unaffected side, and remains so for a few weeks, or until, from atrophic changes, the paralyzed parts become cooler than the normal side. In case of hemiplegia of thrombotic origin the difference in temperature of the two sides of the body at first is less than occurs from hemorrhage; but if encephalitis results from the arterial occlusion, the temperature on the paralyzed side will equal or exceed that of the normal side for weeks, months, or even years, and probably as long as the irritation in the brain remains. In one case under my observation at present, the patient having been paralyzed without loss of consciousness two years ago, although great trophic disturbances have become manifest in the paralyzed limbs, yet the temperature on the affected side remains constantly above that of its fellow. In hemiplegia from tumor or abscess of the brain the temperature may be elevated on the paralyzed side from 0.5° to 2° or 3° F. beyond that of the other, the amount of the heightened temperature on the affected side depending upon the degree of irritation in the brain. Theoretically we should expect to find the difference in the temperature of the two sides of the body greater when the paralysis is due to tumor than when it results from abscess, but I have as yet been unable to determine this point. Slight differences in temperature always in favor of the same side of the body, extending over a considerable period, are significant; but greater differences may occur for a short time and denote nothing of importance.

Thrombosis of the cerebral vessels may take place in persons who have been subjected to causes that are known to be capable of giving rise to cerebral abscess. If this occurs in young subjects, and is followed by encephalitis, headache, paralysis of one group of muscles after another, and a temperature on the paralyzed side equal to or greater than on the unaffected side, the lesion may be mistaken for abscess, especially if the patient denies syphilis and presents no positive evidence of it. Under such circumstances it is probable, although I do not wish to make this point too prominent until further observation enables me to speak more positively, that a temperature on the paralyzed side equal to that of the normal side, or elevated only a few tenths of a degree Fahrenheit above it, would be in favor of thrombosis, while a persistent increase of heat on the paralyzed side of one-half to one or more degrees Fahrenheit would be in favor of abscess. Further, the temperature in cases of thrombosis of a cerebral artery is, as a rule, less variable, and is more commonly normal than that of chronic abscess. The mental condition in cases of focal softening from thrombosis, while it is blunted, is more nearly normal when the patient is aroused than in the cases of chronic abscess that have come under my care. There was one observation made in the case of thrombosis reported in this paper that seemed to point strongly against abscess, and I called attention to it in a clinical lecture the day before the operation. When the patient's leg was first paralyzed the paralysis was complete in all the muscles of the leg and hip, but during the next few weeks paralysis began to lessen in the hip-muscles, and before the patient was subjected to an operation he was able to lift the leg from the bed and hold it straight at the knee. From what we know of the effects of abscess on the surrounding structure of the brain, from œdema and softening, which have a tendency to increase rather than to diminish, it seems very improbable that the degree of paralysis caused by an abscess will lessen before the pus is evacuated. If optic neuritis, with swelling of the disks, were to occur, a thrombotic lesion might be excluded, although hyperæmia of the papilla, with some slight neuro-retinitis, was evident in the eye opposite to the side of the brain-softening in the case reported in this paper. No choking of the disk was observed.

CEREBRAL HEMORRHAGE. It seems useless to discuss the differential diagnosis between abscess and hemorrhage of the brain The condition presented by the case observed by me of hemorrhage into both anterior lobes of the brain, with gradual filling of the ventricles without paralysis, convulsions, or change of temperature to any extent from the normal, must be exceedingly rare. The case was the more confusing because the hemorrhage followed an illness (la grippe) which has given rise to abscess of the brain.

TUMOR. The diagnosis between chronic abscess of the brain and tumor is sometimes very difficult or even impossible. Professor von Bergmann and many others lay great stress upon etiological considerations and the presence of fever in favor of abscess; but, as we have already seen, the history of middle-ear disease, which Bergmann considers the principal cause of abscess, does not preclude the possibility of tumor.

Hitz, as already mentioned, saw a man who for sixteen years had suffered from otorrhœa, and besides had received a blow on the head, yet he died of tumor of the brain. The case of the little girl, eleven years of age, reported in this paper, illustrates the fallacy of laying too great stress upon etiology. She had suffered from otorrhœa, had had an abscess in the right groin, and had received a severe blow to the head, all possible causes of abscess, yet she died from tumor and cyst of the cerebellum. Instead of the presence of fever being a symptom of chronic abscess, a subnormal temperature extending over a considerable period is more commonly the rule. There may be periods of febrile processes in abscess, but we find also the same condition in tumor. Neither tumor nor chronic abscess free from complication, such as meningitis and distention of the lateral ventricles, is, as a rule, attended by fever. If the temperature-record is any aid in the differential diagnosis between these two morbid processes, it is that a prolonged subnormal temperature, in a case of organic brain-disease, associated with evidences of great prostration, such as loss of flesh, strength, appetite, and, at times, a yellowish-pale hue of the skin, is in favor of abscess rather than tumor. We must remember that while a traumatism to the head is a frequent cause of abscess of the brain, it is also capable of giving rise to tumor. In cases of old injuries to the head, dating back more than a year, in which no evidence of inflammation of the brain immediately followed the trauma, the development of organic disease of the brain, supposing the diagnosis to lie between abscess and tumor, the probabilities, other things being equal, will be in favor of the latter. Well-pronounced swelling of the optic disks, amounting to $\frac{1}{30}$ to $\frac{1}{20}$ of an inch (requiring +3 D to 4 D to see the centre of the disk) is always against abscess and in favor of tumor. It is conceivable that an extreme degree of choked disk might occur from abscess, but I have never observed it, and I am not aware that it has been met with by others. Complete blindness is not an infrequent result of tumor, and well-advanced amaurosis is very common. In abscess I have never met with marked amaurosis, and my personal experience in this direction is but confirming the observations of Gowers, Murri, and others. Optic neuritis, limited to the same side of the brain as the abscess, is said to have occurred. It must be exceedingly rare, and as the same eye-phenomenon has been observed in tumor, it has no practical diagnostic value. In a case of distention of the right lateral ventricle from accumulation of a straw-colored watery fluid, observed by me some years ago, well-pronounced optic neuritis was found on the right side, while on the left the eye was normal. Hirt calls attention to the diagnostic value of paralysis of groups of muscles consecutively involved in abscess. This undoubtedly is of frequent occurrence in this disease, but, as paralytic symptoms are found in only about one-half the cases of abscess of the brain, and as the muscular involvement from tumor of the brain sometimes takes place by groups, the phenomenon loses much of its supposed significance in a differential diagnosis. A steady but gradual increase of symptoms of organic disease of the brain, with the development of one nerve-root symptom after another, is in favor of tumor, so are prolonged periods during which the symptoms make but little progress.

The only conclusion at which one can arrive after a study of all the symptoms of chronic abscess of the brain, is that the diagnosis is often a most difficult one, and sometimes is an object of impossible attainment. The nearest approach to accuracy in diagnosis in obscure cases is to arrive at a conclusion which amounts to a problematic diagnosis between two or more morbid processes. To recommend an operation for the relief of chronic abscess of the brain only in those cases in which the diagnosis is certain, is to sacrifice many lives that might otherwise be saved by judicious boldness. The physician who has not the courage to recommend an exploratory operation in a strongly probable case of abscess of the brain, lest he may be wrong in his diagnosis, is more solicitous for his own reputation than for the welfare of his patient.

In conclusion, if we are ever to reach positiveness and certainty in the diagnosis of obscure brain-diseases, it will be attained only by a careful study of minute symptoms and what often seems unnecessary and tedious detail.

# REVIEWS.

Disorders of the Male Sexual Organs. By Eugene Fuller, M.D. 8vo. pp. 200. New York and Philadelphia: Lea Bros. & Co, 1895.

In his preface Fuller states that, in his opinion, " Trouble located in the sexual apparatus, and primarily, at least, largely independent of nervous conditions, is the chief cause of sexual disturbance in the male." This opinion he demonstrates in his book.

The first part of the work is devoted to anatomical considerations. The text is elucidated by a number of original illustrations taken from photographs. Under the general heading of Physiology the functions of the seminal vesicles are particularly considered. It is held that these are: ' First, to aid in attracting the testicular secretion to the seminal vesicles; secondly, to store it there temporarily and to provide means to preserve its vitality during that period; and, thirdly, to expel the seminal fluid as occasion may require."

The Pathology of Seminal Vesiculitis receives careful consideration. The clinical characteristics are discussed at length. The main feature dwelt upon in treatment is stripping of the vesicles. This is thus carried out: " To accomplish the treatment, the patient presenting himself with a full bladder should, while standing with his knees straight, bend the body forward at right angles. Then the operator should introduce the forefinger of one hand well into the rectum, the fist of the other hand exercising firm counter-pressure over the pubes. By these means the end of the forefinger will in all ordinary cases reach well beyond the posterior margin of the prostate. The bodies of the vesicles can thus be detected, one on each side beyond the posterior prostatic border. (Only the lower half of the body of the vesicle can be felt ordinarily by the finger, the rest being beyond reach.) After the forefinger has been so introduced, firm pressure should be made by its tip on the body of the vesicle to be treated as far back as it is possible to reach. Then the finger-tip, the pressure being maintained, should be slowly and firmly drawn forward along the line of the vesicle. The manœuvre is aided by the counter-pressure over the pubes with the free hand. This process may be repeated several times in connection with each vesicle. In this manner some of the vesicular contents, provided the sac be diseased and distended, can be pressed out along its ejaculatory duct and into the prostatic sinus.

" As has been stated, the stripping should be done on a full bladder, and after the manipulation the urine should be voided in order that the surgeon may see how much has been expressed. This treatment should be repeated not oftener than once in four days, and in most cases under active treatment as often as once a week. If it is done too frequently, or too severe pressure with the forefinger is employed, acute symptoms may be stirred up which may leave the patient worse off apparently than before treatment was commenced, besides at times causing an acute epididymitis."

The book closes with a number of very striking illustrative cases. This work of Fuller has rendered a real service in that it holds out promise of successfully treating a class of cases which have heretofore been peculiarly rebellious to every proposed application of therapeutics.

E. M.

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THE NATIONAL FORMULARY. Supplement to the NATIONAL DISPENSATORY. New and Revised Edition. Pp. 115. Philadelphia and New York: Lea Brothers & Co., 1896.

THIS edition shows an increase in size when compared with its predecessor, and presents the formulas of four hundred and fifty-four preparations. Although these are unofficial preparations in the sense that they are non-pharmacopœial, yet so many are in daily use that this work as a guide for the careful physician is second only in importance to the *Pharmacopœia.* As a collection of working formulas for the pharmacist, and as an authoritative mentor to the physician who wishes to increase his therapeutic resources beyond those strictly official, we welcome the convenient form and useful contents of this work which is a fitting supplement to the *National Dispensatory.* Many preparations which are now used under their proprietary names should be replaced by those to be found in this book, whose composition is given and whose construction is based upon scientific principles. We earnestly recommend its careful study and daily use to the end that better and more professional prescribing may result. R. W. W.

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LE HOANG-NAN, REMÈDE TONKINOIS CONTRE LA RAGE, LA LÈPRE ET AUTRES MALADIES. Par E. C. LESSERTEUR, Directeur au Séminaire des Missions Ètrangères. Pp. 235. Paris: J. P. Ballière et Fils, 1896.

HOANG-NAN, A REMEDY FOR HYDROPHOBIA, LEPROSY, AND OTHER DISEASES. By E. C. LESSERTEUR.

WE read with interest this collection of reports, testimonials, and opinions collected from various sources, and presented in good faith and thorough belief in the virtues of the drug. This remedy from Tonquin contains as its active principles strychnine and especially brucine. It is used in the form of pills, each weighing five grains, of which the following is the formula: Alum, 1; natural realgar (which contains less arsenic than the artificial), 1; powdered bark of hoang-nan, 2 parts. The amount of arsenic may be doubled, or the powdered bark may be used alone. For hydrophobia, or the bite of snakes, three such pills dissolved in vinegar should be given, and the amount gradually increased until the physiological symptoms of brucine are seen. It is also claimed that hoang-nan is a preventive. During treatment alcohol in every form as well as stimulating foods are proscribed. For leprosy the pills may be used with or without vinegar. The treatment is commenced by giving one-half of a pill morning and night, the next day one pill at the same times, and increasing one pill each day until five or six are taken at a dose. They are now omitted for twelve days, then the same plan is repeated, care being taken that the treatment shall not be continued for more than seven or eight consecutive days, especially if the patient is not very robust. The drug is also recommended for scrofula, ulcers, and paralysis. The author concludes that in small doses it is a mild cerebro-spinal stimulant, improves nutrition, and is a general tonic. In larger doses it is an energetic nervous excitant, and, like other bitters, it destroys lower parasitic organisms and micro-organisms. We are disposed to agree with the author that the remedy has been of undoubted benefit in the cases cited, and the reasonable explanation is to be found in its chemical composition which is given above. R. W. W.

THE TREATMENT OF PHTHISIS. By ARTHUR RANSOME, M.D. (Cantab.), F.R.S., Consulting Physician to the Manchester Hospital for Consumption and Diseases of the Chest and Throat; Examiner in Sanitary Science at Cambridge and Victoria Universities. Pp. xiii., 237. London: Smith, Elder & Co., 1896.

THE reader who expects to find anything new or startling in this book on the treatment of pulmonary tuberculosis will be disappointed. But he must indeed be a dull physician who cannot glean from its pages many valuable suggestions and learn much that will be of undoubted benefit to his patients. The fact that this work is written from the experience of a single observer, modified somewhat by that of his associates and a fairly extensive acquaintance with British and French literature, precludes authoritative statements upon the use of the various anti-tubercle serums and of recent modifications of older methods, as, for instance, creosote carbonate in place of creosote. Perhaps this very point adds to the value of the book, because in this way the ordinarily accepted methods have received more attention. We would especially commend the carefully studied conclusions in regard to the communicability of the disease, which are in such marked contrast to the hysterical emanations from boards of health. The results of these are simply to alarm the unthinking rather than to indicate, as they do, to the initiated, that an argument for their existence is, of necessity, occasionally promulgated. The climatic treatment is fairly treated, and one following the advice therein contained is not likely to aid in filling the cemeteries of the various health-resorts, nor add to the misfortunes of those whose lives are already a miserable existence. The healthy optimism of the author makes his work helpful and not condemnatory. We are disposed, with increasing experience, to believe that the outlook is even more hopeful. With the exception of a few mannerisms and the occasional use of "tubercular" for "tuberculous" the book is, from a literary point of view, excellent. We commend this volume as the outcome of careful practical work by a discriminating and patient observer, and we predict for it a cordial reception. R. W. W.

The International Encyclopædia of Surgery. Edited by John Ashhurst, Jr., M.D., LL.D. Supplementary volume. New York: William Wood & Co., 1895.

This volume is intended to bring the surgical subjects treated of up-to-date. This object has been accomplished. Some of the chapters are more interesting and instructive than others. A few of the more important subjects are noticed here.

Inflammation, by Harold C. Ernst, M.D., in thirty pages is made a *résumé* of the recent advances in the knowledge of inflammation. Immunity and phagocytosis are discussed. Chemotaxis and bacterial infection of the leucocytes are presented. Chemotactic and phagocytic poison do not explain all the phenomena seen in inflammation, but they surely form an important part in such explanation.

Wounds and Wound-treatment, by Fred. Kammerer, M.D. The fact is emphasized that immediate wound-healing is not the generally recognized method of healing, but that all wounds unite by granulative tissue. Under the modern treatment of wounds the author thinks that the methods are more complicated than of old. What can be simpler than heat to sterilize everything with, excepting hands? He says there is no reason why we should any longer to-day uphold the doctrine that clean wounds are to be treated aseptically and infected wounds antiseptically. There should be no difference in the treatment.

Diseases Complicating Wounds are described by Otto G. Kiliani, M.D.

The article on Tumors, by B. F. Curtis, M.D., is extremely well presented. The terratomata are first considered; secondly, the neoplasms of the connective-tissue group; and, thirdly, using the endotheliomata as a transition-form; there is an admirable description of epithelial tumors.

Injuries and Diseases of Nerves, by John B. Deaver, M.D. Operations upon nerves are not studied with special reference to the end-results, which are of the greatest importance.

Injuries and Diseases of the Neck, by Joseph Ransohoff, M.D. This chapter is admirably classified and well written.

Diseases of the Breast, by Dr. M. H. Richardson, affords a clear summary for the guidance of the operating-surgeon.

Diseases and Injuries of the Bursæ by Charles B. Nancrede, M.D. Greater operative freedom is allowed in the care of the diseases of the bursæ than a few years ago was thought justifiable. In bunion the removal of the bursal sac is advised and all exostoses removed and the head of the metatarsal bone is chiselled down until smooth.

Diseases of the Joints are described by Robert W. Lovett, M.D. Tuberculosis of bones and joints is classed among the questions to a large extent settled. The presence of tubercle bacilli in the affected structures, the inoculation-experiments, the generalization of tuberculosis, the presence in the tissues of tubercle-structures, all point to the identity of the so-called strumous, scrofulous, and fungous diseases, they all being tuberculous. The local treatment of tuberculous joint-disease by tuberculin is discussed and the treatment by the injection into the diseased tissues of some remedy is described. The separate *résumés* are extremely interesting, and, after studying them, one feels repaid and that his knowledge is up-to-date. Dr. Lovett has made very fair deductions from the evidence he presents. The section on Hip-disease is extremely well chosen.

Venereal Diseases: Gonorrhœa, by J. William White, M.D. The specificity of gonorrhœa is pathologically and experimentally proved, almost without doubt. The compressor urethræ muscle is thought to be assisted in preventing the development of a urethritis in the posterior urethra by the diminished vascularity of this portion of the canal. The results of antiseptic treatment are not so uniformly successful as might be expected. No one antiseptic agent can be depended on.

The Simple Venereal Ulcer—Chancroid, by F. R. Sturgis, M.D. The history of the work done since 1889 by various investigators upon the inoculability of the chancroid is stated and the conclusion is drawn that although there is little doubt that a peculiar microbe has been found in the secretion and in the tissues of the chancroid, it is yet too soon to determine its importance as regards the question of inoculation. Are the buboes which follow or accompany chancroids virulent by absorption or virulent by subsequent inoculation? The evidence seems to point to the bubo as inflammatory at the beginning and the virulence as secondary in the large majority of all cases; occasionally, however, there will occur a virulent absorption. In treatment of chancroid nothing new of importance has been presented.

Venereal Diseases: Syphilis, by Arthur Van Harlingen, M.D. He considers syphilis of the circulatory system, and in the general treatment of syphilis describes the hypodermatic method, choosing the prescription: Hydrarg. chlor. corrosiv., gr.viij, sodii chlorid., gr.xv, and aquæ destil.,ʒiij, as being least irritating and most soluble. Fifteen minims of this solution represent about one-twelfth of a grain of the bichloride of mercury.

Surgical Diseases of the Skin, by J. Abbott Cantrell, M.D. Minor additions to the original article have been made. Psorospermosis has been dealt with at some length.

Diseases of the Cellular Tissue, by Samuel Ashhurst, M.D. He favors the view that the cellular tissue of the body contains the starting-points of the lymphatics in its interspaces, though this view has not yet been proved. The cellular tissue is, therefore, more than framework of the body, it is an organ of high value, having functions of a high order.

Injuries of Bloodvessels and Aneurism, by Louis McLane Tiffany, M.D. Emphasis is laid on the simple closure of the lumen of the vessel without rupture of the inner and middle coats in ligature. Aneurismal sacs are to be dissected out when possible and removed entire, ligating distally and proximally the vessel.

Surgical Diseases of the Vascular System, by John A. Wyeth, M.D. The pathology of phlebitis receives careful attention. The method of healing after ligature of arteries is discussed, and the weight of the microscopical evidence seems to point to the fact that any histological element capable of proliferation may take an active part in the organization of a blood-clot. Warren has demonstrated that the muscle-elements take part in the organization of the thrombus.

Injuries and Surgical Diseases of Lymphatics, by Charles B. Nancrede, A.M., M.D.

Injuries of Bones, by John H. Packard, M.D. A very complete *résumé* is given of the most recent cases and the changes in treatment of fractures to date.

Diseases of the Bones, by Charles W. Dulles, M.D. A classification based on the etiology of diseases of the bones is made: (*a*) Disorders of development. (*b*) Disorders of nutrition. (*c*) Disorders of physiological processes. Osteomyelitis is described in much detail.

Injuries of Joints, by Edmund Andrews, M.D.

Excision and Resection, by John Ashhurst, Jr., M.D. Dr. Ashhurst makes a report of his own personal experience in excision of the various joints. He certainly has had exceptional opportunities in this field of surgery, and the article is doubly interesting because of its fresh and vigorous style and because one feels that it is an expression of personal opinion and not a mere collection of facts.

Orthopædic Surgery, by De Forest Willard, M.D., who in a very brief way speaks of foot-deformities and their most modern treatment, and describes a few of the orthopædic affections.

Surgical Diseases of the Head, by Dr. W. W. Keen. This chapter sets forth in a clear, concise, and accurate manner the whole subject of cerebral surgery. I can find nowhere so splendid a statement of the present position of cerebral surgery as here.

De Forest Willard, M.D., writes the article upon Diseases of the Spine. This is a valuable article because it is written from the point of view of the orthopædic surgeon.

Diseases of the Eye and Diseases of the Ear and Nose are presented by C. W. Kollock, A. H. Buck, and R. W Seiss, respectively.

Injuries and Diseases of the Face, Cheeks, and Lips, by John B. Roberts, M.D.

Hernia, by John A. Wyeth, M.D. A statement of the author's treatment of hernia is given. This is no exhaustive study of hernia.

Anæsthetics and Anæsthesia, by Albert I. Boufflleur, M.D. The author states that the evidence points to the use of ether first for surgical anæsthesia by Long, of Georgia. The *honor* of the demonstration to the world of the use of ether in surgery will always be associated with the names of Morton and Jackson, of Boston, who demonstrated its use at the Massachusetts General Hospital in 1846. That an obscure man like Long first used it counts for little. The man who gives his discovery to the world is the great man and deserves the honor of the discovery. The general directions for the use of ether are well chosen.

Construction and Organization of Hospitals, by Edward Cowles, M.D. This is a brief description of several hospitals, illustrating their construction in general and their management in particular.

Injuries and Diseases of the Female Genitals, by Theophilus Parvin, M.D., LL.D. Operations for the restoration of the perineum and for colporrhaphia are described. Tait's, Winckel's, Martin's, and Sänger's operations for ruptured perineum are described. C. L. S.

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CONTRIBUTION A L'ÉTUDE DE L'ATROPHIE MUSCULAIRE PROGRESSIVE TYPE DUCHENNE-ARAN. Par le DR. J.-B. CHARCOT, Ancien interne des Hôpitaux. Paris: Bureaux du Progrès Médical, 1895.

PROGRESSIVE MUSCULAR ATROPHY OF THE DUCHENNE-ARAN JYPE.

THE present work is, as the author modestly states, not a monograph, but merely an attempt to show that the form of muscular atrophy known as that of Aran-Duchenne has a distinct anatomical and clinical existence. Dedicated to the memory of the author's illustrious father, this is a clinical and anatomical study in the best manner of the French school. It is all the more interesting because it is especially in France that the analysis of muscular and spinal paralyses has gone so far that in some recent works one looks in vain for an account of the disease under consideration. This is notably so of the recent *Traité de Médecine* published under the direction of Charcot and Bouchard, in which Marie gives his reasons for erasing the name of progressive muscular atrophy from the nosology. Dr. Charcot in the present work brings proofs of the existence of that disease and its absolute distinction from amyotrophic lateral sclerosis. As to the pathogenesis of the disease he says nothing, at all events he "finds no proof that it depends on an infection or an intoxication." The difficulty of demonstrating the existence of Aran-Duchenne's paralysis, the author thinks, depends largely on the fact that it is not only rare, being less frequently observed than amyotrophic lateral sclerosis and syringomyelia, but that it is essentially chronic, frequently lasting more than ten years, so that the autopsies are rarely possible. The investigations of the author lead him to conclude a close relationship between subacute poliomyelitis and the form of Aran-Duchenne, such as exists between acute and chronic pulmonary tuberculosis. As proofs the author presents a number of careful clinical histories and one autopsy of the chronic form, and the history and histological investigation in a case of subacute anterior poliomyelitis. In these cases there were degenerations occupying the anterior root-zone. This zone is similiar in the two cases, though more clearly defined in the chronic case. Varying in shape in different regions, it seems proportional to the atrophy of the ganglion-cells of the anterior horns. The degeneration extends from the second cervical to the first sacral nerve. The adjacent anterior columns are intact, but in the posterior columns those of Goll are slightly sclerotic in the cervical region.

The relations of these alterations to the clinical features of the disease are discussed in the light of the most recent additions to the knowledge of spinal-cord anatomy. A number of other cases bearing on the question are cited, and the classic article of Strümpell quoted *in extenso* in an appendix. The work is illustrated by colored plates showing the topographic relations of the lesions. It forms an important addition to the literature of the spinal paralyses. G D.

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DIE ERKRANKUNGEN DES RÜCKENMARKES UND MEDULLA OBLONGATA. Von Geh. Med.-Rath, Prof. Dr. E. LEYDEN und Prof. Dr. GOLDSCHEIDER. 1. Allgemeiner Theil. Wien: Alfred Holder, 1895.

THE DISEASES OF THE SPINAL CORD AND MEDULLA. By Professors LEYDEN and GOLDSCHEIDER. General Part.

THIS volume is one of the new systems published under the direction of Professor Nothnagel. The whole work, the lineal successor of the similar systems of Virchow and Ziemssen, which appeared respectively about four and two decades ago, is to be complete in twenty-two volumes, and to include all of internal medicine, with diseases of the urinary and genital apparatus and some diseases of the eye. The names of the numerous authors are well known in medical literature, and the assignment of topics, as usual in such works, in some cases seems somewhat peculiar. However, the most important chapters are in the hands of experts, as evidenced by the fact that Kartulis is to write on Dysentery, Naunyn on Diabetes, Ehrlich on Diseases of the Blood, Litten on the Hæmopoietic Apparatus, Leyden on the Heart, and Senator on the Kidneys.

Diseases of the Nervous System are to be treated in four volumes, under the immediate charge of Leyden, Bernhardt, Möbius, Binswanger, Oppenheim, Lichtheim, Goldscheider, and others.

The present fasciculus of 212 pages forms about one-third of Volume X., the rest of the volume being devoted to special diseases of the spinal cord and medulla and to polyneuritis.

The fascicle begins with a description of the anatomy of the spinal cord and medulla. The gross and microscopic anatomy and the finer histological details are described in the light of the more recent researches. A succinct account is given of the neuron as the basis of spinal anatomy and physiology. In connection with the description of the posterior columns a brief historical note is added on the development of our knowledge of that important part.

The physiology of the cord is presented necessarily in brief form, yet with sufficient fulness for the purpose of the work. The trophic functions receive considerable attention.

The chapter on the General Pathological Anatomy of the Cord begins with a description of methods of examination. This is evidently intended to render clear future references to technical matters rather than to furnish information for beginners. The subsequent sections, on the various changes in diseases of the cord, would have gained much by appropriate illustration. In this chapter the neuron as the foundation of special pathology is particularly considered, and its relation to the older conceptions of system and combined-system disease explained. The importance of vascular changes, syphilitic and other, in causing disease of the cord is briefly stated.

The longest chapter is that on Symptomatology. In it all the varied symptoms, direct and indirect, of spinal-cord diseases are adequately treated. The localization of spinal disease is considered in an appendix to this chapter.

The chapter on Etiology is disappointing from its brevity. Perhaps this subject will be treated more fully in connection with special diseases.

The last chapter on General Therapeutics is brief but of great interest. Drugs, hydro- and balneo-therapeutics, mechano-therapy, operative and orthopædic surgery, and electro-therapeutics are discussed. A specific or even curative action of electricity on the diseased cord is denied, though the possibility of improving morbid conditions in peripheral nerves is admitted. The relation of suggestion to electro-therapeutics is not unfairly stated, the psychic effect, according to the authors, being much more complicated than that ordinarily understood by the word suggestion.

On the whole, the volume well fulfils its object as a reliable and brief guide to the physician who reads German. Even specialists will no doubt find it useful for reference, especially if the complete volume is provided with an adequate index. To specialists, also, references would no doubt be welcome. The press-work and paper are excellent. The work as a whole, if completed on the high grade of this volume, will be a worthy succcessor of its forerunners. G. D.

A PICTORIAL ATLAS OF SKIN DISEASES AND SYPHILITIC AFFECTIONS. In Photo-lithochromes from Models in the Museum of the St. Louis Hospital, Paris. With explanatory woodcuts and text. By E. BESNIER, A. FOURNIER, TENNESON, HALLOPEAU, DUCASTEL, H. FEULARD, and L. JAQUET. English edition edited and annotated by J. J. PRINGLE, M.B., F.R.C.P. Part III. London: The Rebman Publishing Company, Ltd. Philadelphia: W. B. Saunders, 1896.

THIS—the third section of this *Atlas*—deserves the same favorable commendation as the preceding parts. The artistic standard is fully as high, and the selection of cases judicious. The diseases represented are syphilis of the tongue, dermatitis herpetiformis, syphilitic gummata, and epitheliomata of the face. The first plate (Fournier) pictures the several principal types of tongue-ulceration occurring in the advanced stage of syphilis, such as "sclerosing" glossitis and gummatous glossitis. The two forms of sclerosing glossitis are shown, the superficial or cortical, and the deep or parenchymatous. Of gummatous glossitis are exhibited the superficial or mucous form, and the deep or submucous or muscular. These cases are also further elucidated by analytical woodcuts. In the case of dermatitis herpetiformis depicted in the second plate (Hallopeau), the eruption is mostly of the type that is seen in erythema and herpes iris. A woodcut of this is also added. The third plate (Fournier) portrays syphilitic gummata of the thigh. This is an admirable presentation of this phase of syphilis, as is also that plate showing syphilis of the tongue, already referred to. These two plates are valuable additions to our pictorial representations of syphilis. The fourth plate (Besnier) shows a case of "disseminated epithelioma of the face of sebaceous origin." Slight and milder degrees of this condition are not at all infrequent in the practice of those of large experience. While the disease as here presented is much more extensive than usually noted, yet its characteristics are well shown, and the plate has, therefore, a distinct clinical value. This case is also further illustrated by a woodcut. A valuable feature of this publication is the clear and terse character of the accompanying text. Dr. Pringle's English is most readable and his translation from the French most satisfactory. H. W S.

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AN ATLAS OF OPHTHALMOLOGY, WITH AN INTRODUCTION TO THE USE OF THE OPHTHALMOSCOPE. By DR. O. HAAB, Professor of Ophthalmology, University of Zurich. Translated and Edited by ERNEST CLARKE M.D., B.S. (Lond.). New York: William Wood & Co, 1895.

DR. CLARKE has performed a useful service in translating and editing Dr. Haab's *Atlas*, which consists of series of colored plates representing the normal and abnormal appearances of the fundus oculi. We have had occasion to use this *Atlas* not a little in teaching, and can testify to its value, although we believe, in spite of the author's assertion to the contrary, that it would have been better if the drawings had been made entirely by the direct method of examination. As it is, the indirect method has been employed, but the details have been supplied by the direct method. G. DE S.

# PROGRESS

# OF

# MEDICAL SCIENCE.

## THERAPEUTICS.

UNDER THE CHARGE OF

REYNOLD W. WILCOX, M.D., LL.D.,

PROFESSOR OF MEDICINE AND THERAPEUTICS AT THE NEW YORK POST-GRADUATE MEDICAL SCHOOL AND HOSPITAL; VISITING PHYSICIAN TO ST. MARK'S HOSPITAL.

### The Duration of Vaccinal Immunity Conferred by Variola.

Dr. J. J. Matignon has studied this question in the north of China. One hundred and twenty-two children were vaccinated by scarification or pricking; of these, seventy-three were successfully and two doubtfully vaccinated. The average age of the children was five and eleven-hundredths years; the average age at which they had been attacked by variola, three and eight-tenths years. From these observations he concludes that in this country variola confers only a temporary immunity against vaccination; its duration varies from seven to nine and three-tenths years. The success of the vaccination is in proportion to the age of the child, because children here are usually attacked by variola at an early age. Success in these vaccinations is in proportion to the quantity of vaccine inoculated. Vaccination by scarification presents no real advantages over that by pricking. On the contrary, the former is more frequently followed by adenitis, because the pustules are larger and more numerous and give greater opportunity for excavation than in the latter. In these cases the pustules were true vaccinal, because their serum was successfully inoculated in newly born children. There is no relation between the severity of an antecedent variola, judged by the cicatrices found on the face, and the vaccinal receptivity. Finally, it is necessary for Europeans living in Pekin, where the disease is endemic, who have undergone variola, to be revaccinated after a certain time.—*Bulletin Général Thérapeutique*, 1896, 7e liv. p. 314.

### The Treatment of Atrophic Cirrhosis by Hepatotherapy.

Dr. Vidal has made use of the pulp of pig's liver in daily dosage of three or more ounces in three instances. The liver is obtained from an animal freshly killed, and the pulp is scraped with a knife. One and one-half ounces are given at the commencement of each meal in Laborde's *potage au tapioca* *médicinal*, which is admirably tolerated by most patients. This treatment acts by temporarily supplying the functions which have ceased or by producing a diuresis through the renal filter. In the cases reported diuresis was marked —*Les Nouveaux Remèdes*, 1896, No. 8, p. 229.

### THE TREATMENT OF TYPHOID FEVER WITH TYPHOID THYMUS EXTRACT.

DR. GEORGE B. HENSHAW reports thirteen instances of its use, in eight of which the results have been as satisfactory as could be expected. In four the course of the disease has not been materially shortened, and one death from hemorrhage occurred. The injections have not been in any way injurious to the welfare of the patients, and the extract seems to be worthy of a further trial. He would suggest the use of a stronger and more concentrated extract and earlier and more persistent injections.—*Boston Medical and Surgical Journal*, 1896, vol. cxxxiv. p. 477.

### SUPRARENAL EXTRACT IN ADDISON'S DISEASE.

MR. L. A. FRANCIS reports a single instance of the use of five grains of the dried gland as a tablet, three to six times daily. During ten weeks' treatment there was considerable improvement; then the patient remained well for five weeks. At this time he began to lose appetite and again got weak and thin, and finally died about two weeks later.—*British Medical Journal*, 1896, No. 1844, p. 1088.

### LYSSA HUMANA

DR. RICHARD PALTAUF reports upon the use of antirabic inoculation in eighty-one persons, divided into three classes: The madness of the animal determined experimentally or by the development of madness in animals or men bitten at the same time, thirty-six cases; the madness of the animal determined by veterinary examination, thirty-eight cases; in the remainder the madness of the animal was highly probable. So far as known, lyssa has not developed in any of these instances during the year which has elapsed since the record has been finished.—*Wiener klinische Wochenschrift*, 1896, No. 16, S. 285.

### FATAL POISONING BY OYSTERS.

DR. ANTON BROSCH reports a very carefully observed instance. The important findings were hemorrhages of the size of a pin-head in the cerebellum, œdema of the spinal pia, and hemorrhages in the gray matter, especially in the dorsal and lumbar regions, also in the pleuræ and lower portion of the ileum. The cardiac portion of the stomach was ecchymosed and the spleen enlarged. The microscopic examination of the heart and kidneys showed an advanced parenchymatous degeneration of the muscular fibres of the heart and of the renal epithelium. The protoplasm of the liver-cells was filled with large and small fat-balls. The cell-wall and the nuclei were not changed. The hemorrhages were probably due to the manner of the death, and not to the poison itself. Although the chemical examinations are unsatisfactory, the clinical picture is distinct and should not be mistaken. These cases should be separated into two classes: 1. The bacterial cholerines; and (2) the severe poisonings. In the first, evacuants and disinfectants should be given. In the last, the stomach should be cleaned by the pump and the intestine by high irrigation; frequent evacuations of the bladder by catheterization, artificial alimentation by the stomach-catheter, and artificial respiration if necessary. The poisoning is not of bacterial origin, but is due to a toxic substance, resembling an alkaloid, which is found preformed in the body of the animal. Similar bodies have been isolated from mackerel, as hydrocollidin, parvolin, and æthylendiamin. In other fishes compounds have been found resembling curare in their action. In horse-muscle a like substance, named mytilotoxin, has been detected, which gives rise to salivation and diarrhœa.—*Wiener klinische Wochenschrift*, 1896, No. 13, S. 219.

## THE ABSORPTION OF IRON.

DR. JUSTUS GAULE, from his carefully conducted laboratory-experiments, formulates the following statements: 1. Not only the organic, but also the inorganic salts, as the chloride, are absorbed. 2. The chloride is absorbed, since, with the organic substances in the stomach, it is changed to an organic substance. 3. Absorption takes place almost exclusively in the duodenum, although in the stomach and small intestine it can be shown to take place. 4. The absorption takes place through the intestinal epithelium and through the central vessels of the cells; also in similar manner as the fats. 5. Two hours after the entrance of the iron preparation into the intestine there can already be shown in the pulp-cells of the spleen an increased deposition of the so-called iron-reserve. 6. The progress of the iron-absorption is completely normal, and does not result from a disturbance of the normal activity. —*Deutsche medicinische Wochenschrift*, 1896, No. 19, S. 289.

## THE SUBCUTANEOUS INJECTION OF IRON SALTS IN THE TREATMENT OF ANÆMIA.

DOTT. SCIPIONE RIVA-ROCCI presents a very careful study of the literature of the subject. His clinical studies commenced in 1889, making daily use of a 10 per cent. solution of iron and ammonium citrate, one grain and upward of the drug being given in each injection. On account of severe febrile reaction the periods of observation were too short for definite conclusions. Injections of 10 per cent. ethereal solution of ferric chloride proved to be so irritating that he returned to the first-mentioned preparation. The forty cases which are briefly reported show that the method is practicable and yields good results. In every instance in which the injections were continued sufficiently the percentage of hæmoglobin regularly increased, and contemporaneously the phenomena of anæmia, both subjective and objective, decreased. These reports show that the anæmic condition can be markedly benefited by iron when given subcutaneously.—*Il Policlinico*, 1896, No. 8, p. 168.

DR. J. M. DA COSTA has experienced difficulty in finding a stable, non-irritating preparation. The least objectionable is probably ferrous manganese citrate in daily dose of three grains. Full antiseptic precautions must be observed. The crystals are powdered in a mortar and dissolved in hot distilled water, one grain of the drug to five minims of water. Of this, fifteen minims represent three grains of the compound salt. Iron should not be injected indiscriminately, but only when rapid action is needed, as after exhausting hemorrhage or in anæmic persons with delicate digestion, who cannot assimilate iron by the stomach; or in gastric ulcer when it is desirable to prescribe iron, or when iron given by the mouth constipates excessively, or when a decided action on the nervous system is required. It is claimed for iron thus introduced that it remains in the organism as an assimilable substance, producing hyperæmia in various organs and tissues, favoring the absorption of œdema in anæmic patients, the destruction of old red blood-corpuscles, and the formation of new hæmatins. It may act directly upon the whole blood-forming apparatus, and not indirectly, as when introduced by the mouth. Or it may be stored up in the liver, from which it is slowly excreted into the blood.—*Therapeutic Gazette*, 1896, No. 5, p. 289.

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## The Treatment of Pernicious Anæmia.

Dr. Alfred Stengel considers the specific treatment to consist in the use of these remedies: Iron, arsenic, and bone-marrow. Clinical experience allows no question regarding the value of the first in various anæmic conditions. In certain cases of the pernicious variety good results have been obtained; but in most it is of little value, and it may contribute to the patient's discomfort and unfavorably influence the progress of the disease if it should be administered during its active stage. In convalescence, however, it is valuable, as Blaud's pill, iron albuminoid, or one of the physiological preparations. The latter have no special advantage over some of the inorganic preparations, excepting that they may be more acceptable to the stomach and not so constipating. In many cases arsenic is a specific—in that it has really power to combat the progress of the disease and perhaps to effect a cure. It may in some way prevent intestinal putrefaction, increase the resisting power of the blood-corpuscles, or increase the hæmogenetic function. Ordinarily Fowler's solution, administered by the mouth in from five to twenty-drop doses three times daily, proves to be sufficient. If the dose has reached this limit without noticeable change in the condition of the blood, great care should be exercised in the further increase of dose. If gastro-intestinal disturbances are feared, it may be administered hypodermatically in dose from five to ten drops with an equal part of water. The use of bone-marrow can scarcely be said to rest upon a scientific basis, since the marrow is nowise an organic secreting tissue. Regarding the variability in action in different cases, much may depend upon the method of its preparation. The plain marrow cannot always be administered on account of the objection of the patients. The red marrow from the tibia of the calf, mixed with an equal quantity of glycerin and rubbed up in a mortar, results in a preparation of pleasant taste and one that can be eaten with bread without disturbing the stomach. The preparation may be made more fluid by the addition of claret or port wine. Besides these remedies measures directed to the improvement of the general circulation and to the prevention of gastro-intestinal fermentation must be adopted.—*Therapeutic Gazette*, 1896, No. 5, p. 293.

### THE VALUE OF FORCED ARTIFICIAL RESPIRATION IN SAVING HUMAN LIFE IN CHLOROFORM, ETHER, AND NITROUS OXIDE NARCOSIS.

DR. GEORGE E. FELL claims that within the past nine years one hundred human lives have been saved by the Fell method, which would certainly have been sacrificed had reliance been placed upon the methods at the command of the profession previous to this period. The success of the method has demonstrated that two accepted opinions are not accurate: (1) That the air-vesicles of the lungs would not resist forcible mechanical measures; and (2) that the epiglottis would not fall and close the glottis in forced respiration. This method is not only useful in opium-narcosis—the reason for its use at first—but in all cases of asphyxia or superficial respiration from any cause in which artificial respiration may be needed it is the most easily applied and the most reliable method known. A single instance of its use in morphine-poisoning, the drug having been administered hypodermatically, is reported with great care. In this instance the method was successfully employed for four days and three nights; the total time of constant use was nearly eighty hours.—*Medical Record*, 1896, No. 1334, p. 760.

### THE TREATMENT OF ATONY OF THE SMALL INTESTINE IN NEURASTHENICS.

DR. CHALMET, believing that whether the nervous system presiding over the epithelial (secretion and absorption) and muscular functions may or may not play the principal part in this condition, the best method of improving the tone of the nerve is to nourish it better. To improve nutrition he administers during the early hours of intestinal digestion salt-water enemata of a concentration above that of blood-serum—*e. g.*, 0.1 to 1.2 per cent. of salt—in order that he may produce in the large intestine an osmotic current which shall act at a distance upon the small intestine, retarding absorption and permitting the transformation of food-stuffs to go on for a longer period before absorption of the liquid containing these substances in solution.—*Journal des Praticiens*, 1896, No. 18, p. 276.

### POTASSIUM PERMANGANATE IN THE TREATMENT OF OPIUM-POISONING.

DR. ARTHUR P. LUFF believes that his experiments demonstrate the selective faculty of this drug for morphine in the stomach-contents, and confirms Moor's conclusion as to its value as an antidote. When the quantity is known the antidote should be given slightly in excess of the morphine. If laudanum in known quantity has been taken, six grains should be given for each fluid-ounce of poison. If the amount of morphine or opium is unknown, eight to ten grains should be administered, according to the severity of the symptoms, dissolved in from four to eight ounces of water. The stomach should be washed out at half-hour intervals with a weak solution of the antidote. In cases of poisoning by the hypodermatic injection of morphine the hypodermatic injection of the antidote would not likely be of use. In cases of threatened respiratory failure, strychnine, preferably, or atropine should be given hypodermatically, and, if necessary, artificial respiration be resorted to.

Mr. F. P. Maynard states that this is a strictly local antidote, acting only upon such opium as it comes in contact with in the stomach, and can have no effect upon such as has already been absorbed. The treatment is excellent, as leading to a thorough washing out of the stomach and at the same time affording a reliable indication when this has been accomplished. It is not to be expected that it will save life when a lethal quantity has already been absorbed into the circulation, nor can it be regarded as a physiological antidote, as is eserine to atropine.—*British Medical Journal*, 1896, No. 1846, p. 1193.

## Chlorosis, with Especial Reference to its Treatment by Intestinal Antiseptics.

Dr. Charles W. Townsend reports thirty cases, which could be carefully followed, treated with beta-naphtol, without iron, for purposes of intestinal antisepsis. Two grains were given three times daily, and the average length of treatment was three and one-third weeks. The average gain in hæmoglobin per week was 1.85 per cent. There were thirty-one cases treated with Blaud's pills, five grains thrice daily for an average of four weeks. The average gain of hæmoglobin was 5.07 per cent. Seven patients who were constipated were treated with cascara alone, but the results were not very encouraging, for the average loss of hæmoglobin was 1.50 per cent. per week in an average of two and one-seventh weeks' treatment. Of the thirty-one cases above mentioned which were treated with iron, twelve had previously received beta-naphtol for three weeks. These, when put on iron, gained 6.7 per cent. per week for an average of four and two-thirds weeks. An additional series of twenty-eight cases were treated by two grains of beta-naphtol and four grains of Blaud's pills thrice daily. The results were considerably better than those obtained by iron alone and much better than those with beta-naphtol alone.—*Boston Medical and Surgical Journal*, 1896, vol. cxxxiv. No. 528.

## The Question of Dose in Certain Forms of Nervous Disorders.

Mr Walter Tyrrell wishes to record a practical point in the treatment of those nervous disorders which arise from exhaustion of the nervous system. These conditions may be classified as (1) those in which loss of control and irritable action are the main symptoms; and (2) those marked more by depression and loss of functional power. In both forms good results are to be obtained, provided we can nourish the brain without stimulating it; and, further, the doses must be small and a full allowance of time given. Especially useful are cod-liver oil, the phosphates, and small doses of arsenic or iron. The one drug which is most useful is nux vomica, but the pharmacopœial dose of one-quarter to one grain will, in the large majority of cases, increase the intensity of the symptoms. If, however, we use one-hundredth, or even one-half of this, of a grain and continue it for months, instead of days, the result will be a complete, though gradual, recovery.—*British Medical Journal*, 1896, No. 1843, p. 1031.

## THE TREATMENT OF CEREBRO-SPINAL MENINGITIS BY HOT BATHS.

DR. ALFRED WOLISCH reports seven cases, of which five completely recovered. Of the deaths, one was a *foudroyant* case, which died within forty-eight hours, the others in the late stage of the disease, the baths being employed only during the first two weeks. No statement can be definitely made as to the precise action of the baths, although it is probable that the resulting hyperæmia of the skin lessens the amount of blood contained in the brain and spinal cord. It is also likely that in the markedly increased perspiration, the toxin which has accumulated in the blood may be eliminated. These baths in the reported cases seemed to lower the temperature, to have a toning and regulating influence upon the heart, and to relieve pain and restlessness. The method is as follows: The patient is placed in the bath at the temperature of 90.5° to 92.75° F., and hot water gradually added until 104° F. is reached. While in the bath an ice-bag or a Leiter cold-water coil is placed upon the head. The placing in, and removal from, the bath are done with great care and rapidity; this means close proximity of bath and bed, and both should be at the same level. If there is great tenderness of the back, the sheet may be used to move the patient. The bath must be previously cushioned and thorough after-drying omitted. The patient is placed upon a dry sheet, laid upon a woollen quilt, and covered by the same, over which a light cover is placed; he remains in this position for one hour before removal. The time of the bath is immaterial—early morning or late evening. Nourishing food, even meat, should be given; even diarrhœa, should this occur, does not contraindicate it. Wine, brandy (in milk), also beer, are given, for the author regards alcohol as a tonic and hypnotic of the first rank in this disease.—*Therapeutische Monatshefte*, 1896, Heft 5, S. 254.

## ZINC VALERIANATE IN HAY-FEVER.

DR. PETER H. ABERCROMBIE recommends this remedy in pill-form, three grains three times daily after meals for one full month before and the same time after the expected onset of the attacks. As local palliative measures he adds a 5 per cent. aqueous solution of cocaine hydrochlorate, and a snuff composed of bismuth and morphine.—*British Medical Journal*, 1896, No. 1842, p. 967.

## COD-LIVER OIL.

DR. JOHN T. WINTER notes three dangers which threaten the usefulness of this remedy. The first is the result of a modern theory that a part equals the whole. This shows itself in the administration of the so-called alkaloids in place of the oil, when, as a matter of fact, the whole oil must be used if the best therapeutic results are desired. The second is the presentation of the "tasteless" oils, which do not contain any oil at all—a most cruel deception thus to impose upon those who place all their hope for health on this valuable remedy. The third is the unreliability and uncertainty of the emulsions in the market. Therefore, only preparations should be ordered which are reliable and of definite composition. Fortunately, all these dangers can be removed, but at the same time the facts upon which the remedy rests its reputation must be kept clearly in mind.—*Journal of Medicine and Science*, 1896, No. 7, p. 432.

### THE EXPRESSED JUICE OF CARROTS.

DR. S. ARTAULT DE VEVEY reports the results of the use of this substance in the treatment of impetigo and tuberculosis. Succinic acid possesses a certain reputation as a remedy for tuberculosis, and this suggested these vegetables as a source of it, although they apparently rather stimulate the nutrition than possess any local antiseptic effect. The amount given to children is from one and one-half ounces to three times that quantity of the juice expressed from raw carrots, with a pinch of table-salt. Experiments with rabbits showed that when tuberculous the disease made but little progress, while the animals became fat, partly because carrots, from their richness in sugar, albuminoids, and water, are excellent food for these animals. Further than this, their depurative action would be beneficial in such conditions as impetigo.—*Revue de Thérapeutique*, 1896, No. 9, p. 267.

### THE CREOSOTE TREATMENT OF PULMONARY TUBERCULOSIS.

DR. PETER KAATZER has found that the manner and way of administration are important. Sommerbrodt's gelatin capsules (one and one-half grains with double this amount of balsam of tolu) do not yield all the creosote for absorption, because masses of the balsam still containing creosote are found in the feces. The irritant effect of this drug upon the stomach must also be taken into consideration. The pills are also uncertain, having been found undissolved in the stools. Hopmann's mixture (with tincture of gentian) often produces coughing, and besides is of objectionable taste ; when one considers that, in addition, it is often given upon an empty stomach, we find excellent reason for the disfavor in which it is held by the laity. The odor and taste can be concealed by various ethereal oils or by extract of coffee. If the latter is used, there is the additional advantage that the drug is diluted in the stomach. This combination can be given, preferably after meals, in milk or Bavarian beer, but not more than thirty drops of the drug should be given each day.—*Therapeutische Monatshefte*, 1896, Heft 5, S. 265.

### CREOSOTE IN THE TREATMENT OF TUBERCULOSIS OF THE UPPER AIR-PASSAGES.

DR. WALTER F. CHAPPELL has treated during the past three years thirty-two persons, who had tuberculous deposits in some part of the upper air tract, with this drug internally and locally. The former is attained by the use of equal parts of beechwood creosote and compound tincture of gentian up to ninety drops daily, thoroughly mixed with hot milk. For the latter, solution has been made in castor oil, and applications made, either by means of a dropper or an automatic syringe, when the parts are brought into view in a laryngeal mirror. He concludes that there can be no doubt that the drug, internally and topically, is beneficial at some period in many cases of tuberculosis of the upper respiratory tract. When the ulceration is extensive and progressing it will occasionally produce cicatrization; in others, it limits the ulceration and modifies the pain and discomfort. The benefits are as permanent as from any other form of treatment. The greatest relief and progress are obtained in the chronic cases, while small ulcerations are decidedly affected by creosote.—*New York Medical Journal*, 1896, No. 910, p. 604.

## MEDICINE.

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### AN $H_2S$-FORMING BACILLUS AS THE CAUSE OF CROUPOUS PNEUMONIA.

To the interesting literature concerning $H_2S$-forming bacteria JOHANNES MÜLLER (*Centralblatt für innere Med.*, 1896, No. 26) reports the following from the Würzburg clinic: For three weeks a man of fifty-six years complained of loss of energy, headache, and frequent chills. Finally he had a severe chill and other usual symptoms of pneumonia, and when admitted, two days later, presented physical signs of infiltration of the left lower lobe with slight involvement of the left and right upper lobes. There was herpes facialis; the sputum was of characteristic appearance. The urine was clear; chemical examination negative. The patient died two weeks later, having had two pseudocrises, followed each time by renewed infiltration. One day before death the urine was found to be turbid, and the turbidity could not be removed by filtering. Albumin-tests caused but a slight increase in the turbidity. The urine was acid. It had a marked odor of $H_2S$ and gave the usual reaction to lead. Hyaline casts, some of them containing epithelial cells and large numbers of bacilli, were found on microscopic examination. Urine passed later always contained similar bacilli. The sputum and expired air gave no odor of $H_2S$, but the sputum contained bacilli morphologically identical with those in the urine. The bacilli were cultivated from the urine and sputum and from blood taken one hour after death, producing large quantities of $H_2S$ in the cultures. In the sputum only a few other bacteria were present; in the blood and urine the bacilli were in pure culture. Autopsy showed pneumonic infiltration with œdema and recent pleurisy.

The author thinks the unusually long prodromal stage in this case was due to the peculiar organism, which seemed to be a colon-bacillus or one closely related to the latter. The fact that large numbers of virulent organisms can circulate without producing metastases, and pass through kidneys but slightly altered structurally, is strikingly illustrated.

## CARIOUS TEETH AND TUBERCULOSIS.

STARCK (*Münchener med. Wochenschrift*, 1896, No. 7) has investigated the possible relation of carious teeth to tuberculosis, with valuable and suggestive results. Among 113 children with enlarged cervical glands none of the ordinarily accepted causes could be found in 41 per cent., and attention was called to the coexistence of carious teeth. The enlarged glands nearly always corresponded in position to the affected teeth. In many cases toothache preceded the enlargement, or the caries was evidently primary. When a number of teeth were affected there was often a cluster of enlarged glands; with caries in the early stages the enlargement was often slight. In two cases positive evidence of the relationship of the diseases was adduced. These were a boy of eighteen years and a girl of fourteen years, both healthy previously and with no family history of tuberculosis. Enlargement of the cervical glands followed toothache. In the first case tubercle-bacilli were found in the carious molar teeth. In the other a suspicious-looking granulation was found between the roots of a molar, which, on section, showed tubercles with giant-cells. The importance of these observations in practice is obvious. Their relation to other forms of infection, especially septic, and to the frequent malignant new growths of the cervical region, would seem well worthy of future investigation.

## ETIOLOGY OF ACUTE FIBRINOUS PNEUMONIA.

BEIN (*Charité Annalen*, xx. p. 150) reports some cases which throw an interesting light on the etiology of pneumonia. The relation of "cold" is illustrated by the case of a man who attempted suicide by drowning, in which he also received a contusion of the thorax and abdomen by falling flat on the water. In the saliva and sputum virulent pneumococci (demonstrated by injection in rabbits) were found before the occurrence of any signs of pneumonia and before fever. Later, pneumonia appeared and ran an unusually severe and rapid course. The virulence of the infection was also demonstrated by injecting defibrinated blood, obtained by cupping, into a rabbit, which died in eighteen hours. In its blood diplococci were found in considerable number. In the second case the patient, a man, drank spirit of ammonia by mistake. On the second day virulent pneumococci were demonstrated by animal inoculation, but pneumonia did not develop until the seventh day. As the cold in the first case, the depression from the ammonia-poisoning must be looked on in the second as the external or indirect cause, rendering the body susceptible to the action of the pneumococci.

## URICACIDÆMIA IN NEPHRITIS.

VON JAKSCH (*Centralblatt für innere Med.*, 1896, Bd. xxi.) reports eight cases, in addition to a number reported some years ago, in which uric acid was demonstrated in the blood of persons with nephritis of various kinds. From the later investigations it appears that uric acid is retained in the blood during uræmic attacks.

## THE AUSCULTATION AND PERCUSSION OF THE LARGER ARTERIES.

LITTEN (*Centralblatt für innere Med.*, 1896, Bd. xxii.) calls attention to a matter not generally recognized. It is well known that on pressing a stethoscope over an artery a murmur may be heard. This corresponds to a thrill which can best be felt just below the compressed part of the vessel. These phenomena can be brought out over all arteries larger than the radial. They are marked in proportion to the straightness of the artery and the possibility of compressing it against the deep tissues. So they are most distinct over the femorals and the abdominal aorta.

Litten finds that these signs are intensified in certain diseases, such as aortic insufficiency and pseudo-aortic insufficiency, Basedow's disease, and circumscribed arteriosclerosis. The latter is important, because easy to recognize in peripheral arteries; it is difficult when the aorta alone is affected. Symptoms of sclerosis of the abdominal aorta are especially pain in the abdomen, greatly increased by pressure over the aorta; increased hardness and abnormal width of the vessel on palpation, so much so that the inexperienced often mistake it for aneurism. From the great increase in the strength of the thrill in sclerosis, however, the diagnosis can be made. Litten mentions a case in which there were characteristic symptoms of pseudo-aortic insufficiency with pain in the abdomen later. Gradually a pulsating tumor formed in the abdomen, but as there was vomiting of blood the physician was in doubt as to whether the case was one of aneurism or cancer of the stomach. From the signs just described Litten diagnosticated aneurism, which was confirmed post mortem.

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## THE SUDDEN APPEARANCE AND DISAPPEARANCE OF THE ROMBERG SYMPTOM IN TABES.

J. B. CHARCOT reports the case of an ataxic, forty-three years of age, who had had the disease since the age of thirty. The disease had appeared with gradual loss of vision, which was complete in three years; at the same time he had lightning-pains. There was loss of knee-jerk at this time, but no inco-ordination. Two months before the present attack—that is, thirteen years from the onset of the disease—he was taken with incontinence of urine; and twelve days after this, without apparent cause, the patient suddenly found that he could not walk well. He was unable to stand still on his feet, and, on attempting to walk, staggered like a drunken man. The phenomenon presented all the appearances of Romberg's sign, and was even accompanied by the pain which usually accompanies this sign. The sign gradually disappeared, and at the end of two months the patient was able to walk about as well as ever.

The case is interesting, as Romberg's sign has never been observed in tabetics in whom blindness was the first symptom On the contrary, the sign is generally wanting even in those who become blind late in the disease. Furthermore, in this case the patient was absolutely free from the symptom for twelve years, and it then came on suddenly. None of the theories proposed to explain Romberg's sign can explain this case.—*Comptes Rendus de la Société de Biologie,* June 5, 1896.

## INFLUENZA AND ENCEPHALITIS.

NAUWERCK (*Deutsche med. Wochenschrift*, 1895, No. 25) reports two instructive cases. A girl of fourteen years was seized with fever, vomiting and convulsions in the left arm and leg, followed by paresis of the left side, and stupor. Two weeks from the onset death occurred, after unconsciousness and convulsions. Autopsy revealed thrombosis of the sinuses and the veins of the pia and numerous softening foci with capillary hemorrhages in the brain, especially in the upper third of the right anterior central convolution. Microscopical and bacteriological examination, including inoculations in animals, failed to reveal influenza-bacilli or other micro-organisms. In the second case, a girl of nineteen years had headache, vomiting, contracted pupils, and loss of reflexes to light, infrequent pulse, coma, and jactitation, and died in forty-eight hours. On post-mortem examination the ventricles of the brain were found distended, there was an apoplectic focus in the cerebellum, and small capillary hemorrhages in the brain and cord. Pfeiffer's influenza-bacilli were cultivated from the fluid in the ventricles. The bacilli were found also sparingly in the inflammatory foci in the cerebellum. This case shows that the brain may become rapidly infected in influenza without showing signs of the point of entrance other than mild coryza. Perhaps there is primary influenza-encephalitis in which a temporary blood-infection leads at once to a localization in the central nervous system. The fact that the fluid of the acute hydrocephalus contained the specific organisms is of interest.

## ADENOPATHIES IN RHEUMATISM.

CHAUFFARD and RAMON have recently examined a number of cases of relapsing rheumatism for glandular enlargement in cases in which they suspected an infectious origin. In many of the cases examined it was found that the glands, sometimes in the immediate neighborhood of the affected joints, became swollen at the time of the attack. In most of the cases there was some pain in the swollen glands. The swelling of the glands was so appreciable in some cases that the patients had noticed it themselves, and had also noticed that it increased with the exacerbations of the disease.

Cultures made on various media from one of the cases were negative, but cover-slips from the joint-liquid and neighboring enlarged glands both showed a diplo-bacillus.

Histologically the enlarged glands showed the lesions of lymphatics with increase in the trabeculæ of the glands.

The authors regard this glandular enlargement as further proof of the infectious character of rheumatism.—*Revue de Médecine*, May, 1896.

## THE RESISTANCE OF THE ORGANISM TO PROLONGED REFRIGERATION.

LEFÈVRE has recently investigated the effect of the prolonged action of cold baths on the healthy individual.

The experiments were carried on by seating the patient in a bath, the water reaching up to the nipple-level, and taking the axillary temperature at frequent intervals.

Two sets of experiments were made—in the one, the subject remaining in the water three hours, the water being at a temperature of 25° C.; and in the other, the same length of time with the water at 15° C.

The same results were obtained in both cases, and the author draws the following conclusions:

1. There is first a stage of excitement, during which the temperature of the body is elevated.
2. Following this about fifteen minutes there is a stage of depression, which lasts twenty to twenty-five minutes. During this stage the internal temperature decreases.
3. Finally, after an insignificant oscillation, the internal temperature remains at a fixed point. For two and a half hours the coefficient of resistance, almost non-varying, remains at the fixed point, and one can say that the body-resistance is perfect for this length of time.—*Comptes Rendus de la Société de Biologie*, May 22, 1896.

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### ELECTIVE SENSORY PARALYSIS.

BARKER, of the Johns Hopkins Hospital, in the *Journal of Experimental Medicine*, vol. i. No. 2, describes a case of circumscribed unilateral and elective sensory paralysis. By elective sensory paralysis he understands one in which certain only of the functions of the sensory nerves (touch, cold, warmth, pain, and sensation) are abolished. The observations were made upon his own arm, the disturbance being limited to the inner side of the arm and forearm of the left side in the distribution of the nervi cutanei brachii et antibrachii mediales, and depending apparently on the presence of a cervical rib. At certain times he has had sensations of numbness and formication. There has been no disturbance of motility, nor have alterations in the muscles or the skin been perceptible. Sweat-secretion is normal; goose-skin in the affected area occurs exactly as in normal areas. In his investigation the author endeavors to determine exactly the extent and kind of disturbance of sensibility qualitatively, and as far as possible also quantitatively. The sensation for cold, warmth, pressure, and pain was examined, and the distribution of the different sense-points and their threshold-stimuli were carefully determined with exact methods of localization and measurement. The methods of study are all carefully described.

In the area of disturbed sensation sensations of warmth, cold, pressure, and touch were absent, nor could any tickling sensation be elicited there. The sensation of pain was apparently intact, but on accurate testing a slight diminution in the number of pain-points could be demonstrated. The limit of the area was, on the flexor surface of the forearm, sharply and regularly defined, but on the extensor surface was very irregular, invading by deep indentations the normal area, and passing over into the latter only gradually. Nor did the limits for cold, warmth, and pressure-sense entirely agree, single sense-points or groups of sense-points of one kind being found in places where none of the other sense-qualities were represented. The threshold-stimuli for points remaining functional within the anæsthetic area correspond to normal threshold-values. In addition to the study of the merely clinical side of the case Barker made a number of special observations with regard to the physiological relations of the different kinds of sense-points. The occurrence of isolated points and groups of points made the case especially suitable for the decision of certain disputed physiological questions.

Among other things, an attempt was made to determine the smallest amount of heat, the subtraction of which could lead to the reaction of a cold point, and for this the value 0.0024 calorie was obtained. Of twenty cold points examined, eighteen different threshold-values were found lying between the amount of heat just mentioned and a point twelve times as great. The "paradoxical" cold sensation of V. Frey was examined on some fifty cold points of the same area by Kiesof, the majority of these yielding on the application of temperatures of from 40° to 60° C. exclusively the sensation of cold. The relation of the pressure-points to the hair-follicles was confirmed, and in the anæsthetic area the hair-follicles, which though present did not react to pressure, failed also to yield the characteristic oscillatory or buzzing sensation on faradic stimulation. A series of influences, which in normal regions at first evoke other sense-qualities and only subsequently give rise to pain-excitation, called forth in the area of elective paralysis exclusively pain-sensation; thus, for example, pricks with a fine needle excited only a feeling of pain without giving rise to previous touch- or pressure-sensations, and were answered by lively reflexes.

Barker was able to prove further that the so-called temperature-pain is dependent on irritation of the pain-points by heat or by cold, as it can be produced in areas where cold points and warm points are entirely absent. It is, therefore, wholly independent of the temperature-sensations which on the normal skin accompany it or precede it. The capacity for localization within the anæsthetic area where pain exclusively is felt is very incomplete.

The phenomena in the case, clinically speaking, are essentially phenomena of absence, a number of nervous functions peculiar to the normal skin not being present. Phenomena of irritation were by no means prominent.

The author concludes that the cause of his disturbance is peripheral, and refers to other cases in which through pressure of a cervical rib disturbances of sensibility and motility have resulted.

The possibility of localization in the nerve-roots or cord is excluded. The abolition of temperature-sense and the sense of touch with retention of pain-sense represents only one of the numerous variations possible in elective injuries of peripheral nerves, and cases are cited from the literature which substantiate this statement.

For a number of other physiological considerations the original article must be consulted.

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## The Gastric Juice in Tabes Dorsalis.

Nuchard and Boret have recently reported some cases of tabes associated with gastric crises, in which they made careful examinations of the gastric juice.

They found great variability in the reaction of the gastric juice, the changes in reaction occurring with great rapidity, so that a patient who had had a hyperacid gastric juice for a week or more would suddenly be found to have a subacid one, and *vice versa*. From the character and rapidity of these changes they regard it as very difficult to explain the lesion present upon anatomical grounds. The authors are inclined to think that this great variability in reaction may be a valuable diagnostic point in distinguishing gastric crises with hæmatemesis from wound-ulcer of the stomach.—*La Progrès Médical*, February 15, 1896.

### THE FAVORABLE EFFECTS OF PNEUMOTHORAX ON PULMONARY TUBERCULOSIS.

JANOVSKY reports some cases of pneumothorax, occurring in connection with pulmonary tuberculosis, which lead him to believe that this complication at times has a favorable effect upon the lung-process. In four of eight cases which he abstracts from Najnikoff improvement followed the perforation. Najnikoff explains this on the grounds that the pleural exudate which resulted from the pneumothorax compressed the lung-tissue and rendered it anæmic, an arrest of the lung disease resulting from this anæmia.

Janovsky's own case occurred in a young girl, who, after a three months' illness, had all the signs of cavities at the bases, the process of consolidation reaching the apices at the end of five months. At this time a perforation into the pleural cavity occurred with signs of pneumothorax, but practically no effusion.

The patient immediately began to improve, and gained thirty pounds in weight in a comparatively short time, the lung showing signs of induration.

The pressure on the lung from an exudate could not explain this case, as practically no exudate was present.

The author explains the beneficial result on the grounds that with the pneumothorax the negative pressure in the pleural cavity disappeared and the lung collapsed; the inspired air, instead of entering the lung, entered the pleural cavity through the perforation, and compressed the lung, much as the exudate had done in Najnikoff's cases.—*La Presse Médicale*, February 1, 1896.

### HYSTERICAL HÆMOPTYSIS.

MATHIEU and MILIEU have recently investigated the blood-stained expectoration of several hysterical patients who came under their observation.

The expectoration of the blood-stained material occurred either in the morning or at night, about three or four hours after retiring. The material had the appearance of red currant-juice mixed with water, or in some intances that of syrup of rhatany; it never coagulated. The quantity of fluid varied from sixty to one hundred grammes, and was usually all expectorated at one effort.

The expulsion of the fluid was often preceded by a sensation of burning at the pit of the stomach, or perhaps by an aura simulating an abortive hysterical attack. Vomiting of food never occurred. At times epigastric tenderness was noted just to the right of the median line in the pyloric region. The attacks often occurred every day for two or three weeks, and were sometimes replaced by true hysterical attacks. The ejected liquid, on standing, settled into two layers—a clear upper layer and a lower darker layer. The upper layer contained no formed elements, the lower contained mucus and white and red blood-corpuscles. The reaction at times was acid, indicating the presence of gastric juice; at times alkaline, when the fluid elements were mostly saliva. The proportion of blood to saliva was about one to twelve.

It seems probable that the blood can come from the stomach, the tonsils, or the tongue.—*Gazette Médicale de Paris*, February 1, 1896.

### Herpes Facialis as a Symptom of Bacterial Intoxication.

Friedreich (*Berlin. klin. Wochenschrift*, 1895, Nos. 49 and 50) made some experiments with cultures of streptococci, as used by Coley in the treatment of malignant disease. In seven cases herpes facialis was observed. All these were cases in which sterilized cultures of streptococcus and prodigiosus were used. The eruption appeared not earlier than thirty nor later than fifty-eight hours after injection, and in two cases was followed by recidiva. As there was no infection in these cases, the herpes must be looked on as due to intoxication.

### The Blood in a Case of Metastatic Cancer of the Bone.

J. Epstein (*Zeitschrift für klin. Med.*, Bd. xxx. H. 1 and 2) has studied the condition of the blood in a case of scirrhus of the mamma with extensive metastases, including the marrow of many bones. The red corpuscles showed great variation in size, from 5 to 10 micromillimetres; there were many nucleated red corpuscles, including many megaloblasts with bizarre nuclei. The bodies of the red corpuscles showed degeneration. The leucocytes were greatly increased—from one to twenty-five to one to forty red. There were large neutrophile marrow-cells. Only two eosinophile cells were present. Epstein thinks the condition of the leucocytes was due, not to the cancer alone, but to atypical growths of blood-forming tissue in the marrow.

### A Case of Diphtheria Treated with Concentrated Serum, with Remarkable Symptoms.

Auersbach (*Centralblatt für innere Med.*, 1896, No. 18) saw a patient on the second day of a moderately severe diphtheria, with a dirty-green membrane on the tonsils and palatal arches, painful swellings in the neck, and a temperature of 103° F. He injected 2 c.cm. of concentrated serum, equivalent to 100 units. The temperature fell, but the membrane extended. Liquor ferri was swabbed locally, and the membrane finally disappeared by the tenth day. The swelling in the neck increased so much that suppuration was feared. A second injection was being considered when, on the fourth day, a typical erythema exudativum *seu* nodosum appeared over both ankles, with great pain and œdema. Next day a similar eruption appeared over the smaller joints of the feet, the knees, and hips, with swelling in the joints. There was also a scarlatinous eruption on the back. During the next few days the eruption involved the joints of the arms, so that all motion was painful. Slight fever continued all this time. Menstruation appeared and was excessive. Albuminuria was present, without casts, and continued up to the time of the report, two months later. The erythema and joint-symptoms were not affected by sodium salicylate. On the twenty-third day the symptoms seemed to be disappearing, but on the twenty-fourth periostitis began on the tibia and ulna, and lasted a week. No explanation seemed possible for the remarkable complications in this case.

# SURGERY.

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## CATGUT-STERILIZATION.

HOFMEISTER (*Centralblatt für Chirurgie*, 1896), after referring to the different methods of catgut-sterilization that have been employed in Braun's clinic at the University of Tübingen, recommends the following process, the value of which depends upon the capability of formalin of acting on lime-substances so that they lose their solubility in boiling water:

1. Harden the raw catgut, which has been previously wrapped upon rolls, in 4 per cent. solution of formalin for twenty-four hours.
2. Boil in water for ten minutes.
3. Harden again in the formalin solution and preserve in alcohol, to which 5 per cent. glycerin and 1 per cent. sublimate or other antiseptic in suitable quantity has been added. The strands remain from the beginning of the sterilization on the same rolls, so that touching with the fingers may be avoided. It is necessary to wind the catgut before beginning the sterilization, because the loose catgut rings entangle when placed in the solution and in boiling become converted into unravelled balls. When putting the rolls into the solution of formalin much care has to be taken to remove the great number of air-bubbles which remain among the strands, so as to have the finished preparation uniformly firm. The tensile strength of the sterilized threads which were examined with a dynamometer compared favorably with the raw catgut.

Bacteriologic investigation showed the prepared catgut to be free from spores.

In the *Semaine Médicale*, 1896, No. 3, there is a note in which HLAVACZEK also confirms the fact of the resistance of formalin catgut, and states that the Society of Physicians at Vienna proposes a procedure which resembles the one described, both of which are in confirmation of Hofmeister's studies.

### Modern Methods of Gastrostomy.

Chavasse, in a clinical lecture on this subject (*The Lancet*, London, 1896, vol. ii. No. 1), describes the following modern operations: (1) Hahn's, 1890; (2) Witzel's, 1891; and (3) Albert's, 1892.

In Hahn's method the abdomen is opened by a transverse incision below the ribs, and, the stomach having been exposed, a second incision is made in the left eighth intercostal space, through which the organ is drawn out and fastened between the cartilages; it is then opened. The idea is that the ribs will act as a stopcock and so prevent leakage. In the only example the author saw of this method this object was not attained during the ten days the patient survived the operation, and it certainly appeared to give rise to more pain than the ordinary operation; it is also possible to wound the pleura or the diaphragm, or a necrosis of the cartilages may subsequently supervene.

In Witzel's method the primary incision commences in the middle line, a finger's-breadth below the left costal cartilages, and is carried transversely outward for three or four inches. The rectus muscle having been laid bare, its fibres are separated by the handle of the scalpel, held apart by retractors, and the peritoneal cavity opened. A portion of the stomach is now drawn outside, packed around with warm sponges, and opened on its anterior surface by a small incision placed near its cardiac end, sufficient to permit the introduction of a fair-sized drainage-tube. The tube should be about five inches long, and about one inch of it should be inserted into the cavity of the stomach and anchored there by two or more sutures which penetrate the muscular and peritoneal coats of the organ and the India-rubber tube so as not to open its calibre. Silk sutures are next passed half an inch from the tube through the muscular and peritoneal coats of the stomach, over the tube and through the corresponding coats on the other side of it. From four to six sutures may be so inserted, but all should be passed before any tying is attempted. When this is done the tube will be found encased in a peritoneal funnel, except at its upper part. If necessary, other superficial sutures may be added between the deeper ones. Four or five silk sutures on either side are next employed to secure the viscus to the cut edges of the abdominal wall, and the wound is lightly packed with iodoform-gauze. If deemed necessary, milk or other nutriment may now be injected through the tube; but it is preferable to wait twenty-four hours, when some adhesions will have formed.

Albert's method: An incision two fingers'-breadth below the margin of the left ribs is carried downward and outward over the rectus muscle for three or four inches, and its fibres having been exposed are separated vertically toward the inner edge of the muscle by the handle of the scalpel or some blunt instrument. The peritoneal cavity having been opened, a sufficient portion of the stomach to reach the costal cartilages is drawn out of the abdomen. It is then anchored in that position by stitching with continuous or interrupted silk sutures on each side of the serous and muscular coats of the organ to the parietal peritoneum and the posterior layer of the rectal sheath. Through the skin at the level of the cartilages, about one inch from the outer edge of the wound in the parietes, a small incision, half an inch long, is made, and a bridge undermined between this and the primary incision. Under this subcutaneous bridge the extruded portion of the stomach is drawn upward, and a small opening having been made into its cavity by incising its anterior wall, the edges of this mouth are secured by four or more fixation-sutures to the edges of the small skin-wound. The first incision in the abdominal wall is then completely closed. As a result of this procedure a portion of the stomach becomes subcutaneous, is bent forward, and forms a sort of artificial œsophagus, the back of which is gripped by the muscular fibres of the rectus, which act as a sphincter.

The chief difficulty experienced by patients after gastrostomy has been the leakage from the fistula, especially during the process of digestion. As a consequence, the skin around the orifice becomes the seat of a chronic eczema, which is very troublesome to the patient.

In comparing Witzel's and Albert's operations the author states that one is as readily performed as the other, but occasional difficulty will be experienced in drawing the stomach forward and upward sufficiently in the latter method on account of the organ being fixed by the neoplasm. More gastric and general disturbance follows its performance than that of Witzel's, due to the necessary traction on the stomach-wall. The opening into the viscus is also apt to contract somewhat under the bridge of skin. When complete, however, it has the advantage over Witzel's method in that no tube need be worn. It would be more difficult, the author states, to close the fistula, if required, after Albert's than after Witzel's operation; but in most cases the operator desires the opening to remain permanently. Both methods give satisfactory results as regards the absence of leakage, and both are very distinct advances on the older methods.

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## THE OPERATIVE TREATMENT OF DILATATION OF THE STOMACH.

EWART and BENNETT describe in *The Lancet*, London, 1896, vol. ii. No. 1, an operation for dilatation of the stomach which they believe to be new.

The abdomen having been opened by a median incision about five inches long, commencing above at a point an inch below the ensiform appendix, the stomach was thoroughly examined by the hand introduced through the wound. No adhesions were detected and the pylorus was normal. The viscus was then drawn out of the abdomen and laid upon the parietes, where it presented a large balloon-like bag distended with gas. A fold on the anterior aspect of the stomach was then turned in by the fingers of the assistant. The length of this fold, which followed the direction of the long axis of the stomach, was about twelve inches, its greatest depth being about three inches. While this fold was held involuted by the assistant's fingers the peritoneal surfaces on the opposite sides of its base were brought together by numerous sutures made to transfix the peritoneal and muscular coats, the fingers of the assistant being gradually withdrawn from the fold before the tightening up of the final stitches. After the stitches had all been fastened off the size of the stomach was greatly lessened. Mr. Bennett had intended to make a small secondary involution at the great end of the stomach to prevent the otherwise inevitable dependent tendency of that part; but as the patient was in a very unsatisfactory condition generally, it was thought wiser to be content with what had already been done. The altered viscus was then returned into the abdomen, the wound in the parietes being closed by fishgut sutures in the usual way.

The patient presented the ordinary symptoms of dilatation of the stomach in a marked degree. He had had the benefit of the various forms of palliative treatment without any relief. The patient, after leaving the hospital, was able to resume his work, which was that of a carpenter.

Under the title of "Gastropexy," DURET describes in the *Revue de Chirurgie*, June 10, 1896, an operation for the condition of dilatation and downward displacement of the stomach, which is known as gastroptosis or Glenard's disease. The operation is performed as follows: An incision four inches in length is made in the middle line of the abdomen, beginning at the ensiform cartilage. The peritoneum is divided only in the lower half of the wound, the upper portion being left undivided to receive the sutures which hold the stomach in place. The pylorus and lesser curvature are then fixed to the anterior abdominal wall as follows: The stomach having been raised and placed in its normal position, a silk suture is made to include the serous and muscular coats of the pyloric extremity, and is then passed through the overlying portion of exposed peritoneum from within outward. The suture is carried backward and forward in this way until the stomach has been well anchored. The external wound is closed layer by layer.

## PERFORATING ULCER OF THE DUODENUM.

J. COLLINS WARREN records a case of perforating ulcer of the duodenum in the *Boston Medical and Surgical Journal*, 1896, vol. cxxxiv. No. 19. The patient was a man, sixty-two years of age, who had suffered six years previously from a sudden, violent attack of abdominal pain, with great distention and constipation. Since that time he had had frequent attacks of acute pain in the pyloric region, for which he usually took a quarter of a grain of morphine.

When seen by Dr. Warren the patient had pain and tenderness in the right hypochondrium, extending downward toward the right iliac fossa. The temperature was 100.5° and the pulse 100.

The symptoms were thought to be probably due to perforation of the appendix, and as the patient's condition was unsatisfactory an exploratory operation was performed. The appendix was found to be normal, but as the exploration was continued in the direction of the right hypochondrium a perforation of the duodenum was discovered. About the perforation was an area of inflammation and the adjacent coils of intestine were glued together, partly closing off the general peritoneal cavity. The opening in the duodenum was closed with silk Lembert sutures, drainage was introduced, and the parietal wound was closed. Death occurred on the third day. After operation there were great thirst and vomiting of a brownish substance. There had been no motion of the bowels.

THOMSON reports in *The Lancet*, London, 1896, vol. ii. No. 1, three cases of operative interference for perforated ulcer of the stomach, two of which made excellent recoveries. The author states that it has been amply shown that life is to be saved by prompt operation in these cases. More precise knowledge is still required, however, in (1) the accurate diagnosis of the occurrence of perforation ; (2) the most favorable period for surgical interference ; and (3) the best method of dealing with (*a*) the perforation when found, and (*b*) the extravasation into and infection of the peritoneum. The mortality in these operations, as has been shown by Weir, bears a direct relation to the time that has elapsed between the perforation and the operation. The author does not consider it wise to wait until the shock which follows the perforation has passed off. He recommends the administration of whiskey and hot water by the rectum and strychnine hypodermatically, and to proceed at once with the operation. The ulcer is best dealt with by simply invaginating by means of Lembert sutures. A considerable area of stomach-wall should be included in the suture. If the perforation is in the neighborhood of the pylorus, this may entail an undesirable degree of stenosis if the suture-line corresponds with the long axis of the stomach. In such cases it is better to make the suture-line at right-angles to the axis of the pylorus, after the principle of the Heinecke-Mikulicz operation for pyloric stenosis. The extravasation into the peritoneal cavity is best dealt with by a copious flushing with saline solutions at a temperature of from 105° to 110° F. If there is general infection of the peritoneum, the author drains by means of tubes the pouch of Douglas, and, if necessary, a tube is passed through an incision in the loin below the right kidney to drain the lumbar pouch. A tube may be placed to drain the area around the ulcer, but this is the least important of the three.

### RUPTURE OF THE URETHRA TREATED BY IMMEDIATE SUTURE AND BLADDER-DRAINAGE.

WEIR reports (*Medical Record*, New York, 1896, vol. xlix. No. 19) two cases in which he performed immediate suture for rupture of the urethra—one on the fourth day, and the other thirteen hours after the injury. In the first of these a small suprapubic opening was made in the bladder, and a soft-rubber catheter inserted for drainage.

The following is a summary of the article :

1. In an injury of the perineum with painful or difficult urination, accompanied with a free flow of blood, with or without a perineal or scrotal swelling, a free perineal incision should be made and the urethra exposed. 2. If this canal be ruptured partially or totally, the separate ends should be sewed together with silk or catgut. 3. Drainage of the bladder should be employed either by a catheter by the urethra, or preferably by a suprapubic opening. To aid in carrying out the latter Cathcart's or Dawbarn's method of siphonage should be employed.

The author prefers pure silk for sutures, with which he includes the mucous membrane and other coats of the urethra. These are supplemented by two or three extra urethral sutures to relieve the tension on the urethral sutures. One or both ends are left long and are brought out of the wound so that traction may be made on them at the end of a week or ten days. Weir was much impressed with the value of bladder-drainage after the method devised by Cathcart.

In the cases of complete rupture of the urethra in which the vesical end cannot be found, it is recommended to douche the wound for five or ten minutes with hot antiseptic solution, when the divided urethra will be more or less distinctly revealed.

## THE TREATMENT OF IRRITABLE SPINE.

Under this title GIBNEY (*Medical Record*, New York, 1896, vol. xlix. No. 19) includes those cases variously described as spinal hyperæmia, spinal necrosis, and hysterical spine. These cases usually exhibit spinal tenderness, various pains in the course of the nerves, a weak back, fatigue on little exertion, lack of symmetry between the scapulæ, obliquity of the pelvis, etc. The author describes a typical case as follows:

"A lady who has borne one or two children has for a year or more complained of her back; has had remissions of pain followed by rather sharp exacerbations; has been quite active at times; has presented a tenderness over the spinous processes and lateral masses, with pains occasionally in the course of the lumbar or lumbosacral nerves, and has gotten into the habit of standing awkwardly in order to rest herself. This awkward position has produced an obliquity of the pelvis and a compensatory scoliosis, a simple, lateral deviation of the column. I find her fairly well nourished and get a pretty good history negatively of the internal organs. Examination of the column reveals, as just indicated, a lateral curvature in the lumbar region to the right or left side, very slight, and an inequality of the iliocostal spaces, also very slight; sometimes a lack of symmetry between the scapulæ, sometimes an antero-posterior curvature of the spine, the correction of which causes increased pain in the back, a spinal tenderness, and sometimes tenderness on concussion. By equalizing the two sides of the pelvis I am able usually to demonstrate the compensatory nature of the curvature, and by testing the columns as to flexibility I am able to rule out any bone-lesion."

It is frequently necessary to distinguish these cases from curvature of the spine.

The treatment consists in counter-irritation, the administration of tonics, graded exercises, out-of-door life, and, in obstinate cases, a spinal assistant. As a counter-irritant the author prefers the Paquelin cautery, applied with very light strokes three times a week for a month or six weeks. In some cases he uses fly-blisters or mustard-plasters, the latter being applied every night for one or two weeks. After the immediate effects of the counter-irritant have passed it is recommended to apply strips of adhesive plaster over the sensitive area. They are cut three or four inches long and one inch wide, and are arranged criss-cross over the spinous processes.

## A NEW APPARATUS FOR IMMEDIATE AND PERMANENT DRAINAGE OF THE URINARY BLADDER AFTER SUPRAPUBIC CYSTOTOMY.

BLOODGOOD describes in the *Bulletin of the Johns Hopkins Hospital*, 1896, vol. vii. No. 61, an apparatus which he has found to drain effectually the urinary bladder after suprapubic cystotomy. It prevents leakage of urine and the consequent soiling of the patient and irritation of the surrounding skin which are so constantly observed in these cases.

The apparatus consists of a rubber-bag reservoir, 18 x 12 cm. in diameter, and holds about 350 c.cm. It has been found in practice that patients usually empty the reservoir when about 250 c.cm. of urine have collected. Sealed to the upper and central portion of this bag is a thicker piece of rubber with a small opening in its centre, into which the head of the hard-rubber tube that drains the bladder is inserted. The ends of the abdominal belt are also fastened to this piece of rubber. The abdominal belt supports the entire weight of the bag, so that there is no dragging on the drainage-tube. Two rubber tubes lead from this reservoir, the lower one being used to draw off the urine and the upper one to wash out the bag. Both are provided with stoppers.

The drainage-tubes for immediate and for permanent drainage differ. That for immediate drainage is made of hard rubber, and consists of three pieces—a head 2 cm. long, with a flange at one extremity and a thread cut on the balance. This flange is to be inserted into the hole in the bag, the elasticity of the rubber making a snug fit; a saucer-shaped piece with a thread to fit the former is screwed on the head, thereby grasping the bag firmly and preventing leakage of urine, and a straight tube 10 to 15 cm. long and 1.5 cm. in diameter; 1.5 cm. from the vesical end is a flange 5 mm. in width, pierced by four holes. This piece also screws on the end of the head that projects from the bag.

The tube is put in place by introducing four silk sutures through the bladder-wall, not including the mucous coat, aud passing the inner ends of the suture through the corresponding holes in the flange of the tube. The posterior surface of this flange rests on the anterior surface of the bladder. The sutures are tied, but not cut, the ends being carried out of the wound.

The tube for permanent drainage has no flange; it should project into the bladder at least 1 cm.; the vesical end should be slightly bulbous and either straight or curved, according to the direction of the sinus.

For immediate drainage a rubber tube can be attached to that connected with the reservoir, and continuous drainage into a vessel at the bedside obtained.

In the last two cases a purse-string suture was placed in the bladder-wall around the tube, in addition to the four sutures mentioned.

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## The Next Great Advance in Anæsthesia.

In an address on this subject (*The Lancet*, London, 1896, vol. i. No. 16) before the Society of Anæsthetists Sir Benjamin Ward Richardson, after describing the disadvantages of the anæsthetic agents at present employed and his view of the manner in which these agents act, states it as his belief that a substance should be found which will destroy sensation without affecting consciousness. He says: "I look hopefully for a method in which, by means of a single agent, we shall be able at will to suspend common sense alone or to exalt the process into suspension of consciousness." The author has found that the element chlorine is a dangerous substance to be combined with an anæsthetic. It is this substance that renders chloroform so unsafe for the production of general anæsthesia. Richardson has used bichloride of methylene with success. It has, however, to some extent the same objectionable features as has chloroform. He thinks that methylic ether possesses the best qualities fcr producing general anæsthesia. The objection is that it is a gas and somewhat difficult to handle. This substance destroys sensibility before consciousness, and recovery from its effects is exceedingly rapid. The author cites a recent death from chloroform, and calls attention to a too common error in the administration of all anæsthetics.

The patient was a healthy young man who submitted himself to the narcotic for the operation of tooth-extraction; he was fully examined beforehand and gave no indications of disease; he inhaled with readiness; the operation was performed dexterously; the chloroform was perfectly pure; and the post-mortem appearance afforded no evidence of the cause of the collapse. These frequent recurrences of deaths supports the conclusions already advanced as to the danger attendant upon the reception of all bodies of the chlorine series, and they also suggest that every specimen of that series should be administered slowly and in small quantities, so that narcotism should be induced by eighteen to twenty minims at the most. The question of small and slow administrations is one of the most critical, and makes a distinction between surgery proper and anæsthesia, which is of vital importance. When there was no anæsthesia surgical art was of necessity predominant. That surgeon was the most brilliant man who could operate most quickly and, with a steady nerve, could perform any possible operation. As the result of the work of ages it became natural that surgery should still in our days hold the first place, and that although in nineteen cases out of twenty the surgical operations might be mere bagatelles as compared with the production of unconsciousness by a narcotic agent, it has required a long time and a hecatomb of deaths for the fact to be demonstrated that the work of the anæsthetist calls for the first and most serious consideration. The old conception has continued to keep surgery in its original state and to cause anæsthesia to be looked upon as a mere adjunct. There is another element of danger in respect to the question of time. As in surgery brevity was the primary process, it came to be expected, both by the public and by the profession, that brevity in anæsthesia ought to keep pace. Thus, during an operation the surgeon expects the completest insensibility, and, not getting it, spurs on the anæsthetist to be as brief as he wishes to be himself—a direction which the administrator, by habit, is as willing to obey as if he were simply an adjunctive aid. In the future all this must be changed. The anæsthetist must know and feel that he must be left quite independent in producing painlessness, while the surgeon, however brilliant, must follow his lead and not think of operating until the patient has been pronounced by the administrator safe, senseless, and ready for the knife.

### Ulcerative Endocarditis due to the Gonococcus.

### Gonorrhœal Septicæmia.

Thayer and Blumer, after an exhaustive historical review of this subject (*Bulletin of the Johns Hopkins Hospital*, 1896, vol. vii. No. 6), record a very carefully observed case which they believe justifies the conclusion that the organism present in pure culture in the circulating blood (during life) and on the affected valves of the heart (at the time of the autopsy) was the gonococcus of Neisser, because:

(*a*) Its form and arrangement were characteristic.

(*b*) While present, free, the cocci were frequently found crowded in the protoplasm of leucocytes in the thrombus on the valve.

(*c*) It refused to grow upon the ordinary media.

(*d*) It grew readily upon a mixture of human blood and agar-agar (one-third blood).

(*e*) It decolorized when treated by Gram's method.

The question of the point of entry arises, of course, immediately. Nothing definite was known of the manner of life of the patient before entry. The fact that cover-slips from the vagina and the interior of the uterus showed similar diplococci, decolorizing on treatment according to the method of Gram, leaves little doubt that the infection took place through the ordinary channels.

# OTOLOGY.

UNDER THE CHARGE OF

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## Nasal Hypertrophy and Ear Disease.

MacNaughton Jones (*V. Internat. Otol. Congress: Annales des Mal. de l'Oreille*, vol. xxii.), after careful investigation into the causative relation between hypertrophy of the turbinates and deafness, based upon an examination of 300 cases of aural disease, in which he found only 69 hypertrophies of the turbinates and 18 deviations of the septum, concludes that in only a quarter of the cases can nasal obstruction be regarded as causative of deafness. It is his opinion that too much and too severe treatment has been directed toward hypertrophies of the turbinated bodies as a means of curing deafness. Especially to be condemned is turbinotomy in such connections.

## Adenoids in Relation to Deafness.

Arslan (*V. Internat. Otol. Congress : Annales des Mal. de l'Oreille*, vol. xxii.), in an article on adenoid vegetations in the nasopharynx, concludes, regarding their origin, " that heredity and the dyscrasiæ are the chief etiological factors, while a damp climate and infective processes act as a subordinate part in the causation of these growths. The operation for their relief should be performed at one sitting. The knife of Moritz-Schmidt should be used, to be followed by digital crushing. Bromide of ethyl is the best anæsthetic in the ablation of adenoids, being incomparably superior to chloroform, ether, and perhaps to nitrous oxide. Adenoids should always be removed, even when small ; and all children, before being accepted into schools, institutions for the deaf and dumb, and other places of education, should be subjected to a nasopharyngeal examination."

In the discussion which followed Helme maintained that the introduction of the finger into the nasopharyngeal cavity after the operation, to assure one's self of the completeness of the latter, is a *septic* procedure.

GRADENIGO (*loc. cit.*) opposed irrigation of this region either before or after operation, especially in children, since, on account of the width of the Eustachian mouth in them, the injections easily enter the middle ear and set up an otitis media. As "blood is certainly the best of antiseptics," it should be allowed to flow, in reason, after operations. In these views Gradenigo was sustained by Brieger. Moure, however (*loc. cit.*), did not share the fears of Helme regarding infection of the lacerated tissues in the nasopharynx by the index-finger of the operator.

## THE THYROID GLAND AND THE MIDDLE EAR.

SPEAR (*Boston City Hospital Med. and Surgical Reports*, 1896) claims, as a result of his own observations, that the thyroid gland is "the centre of a nervous system which controls, through connections with the sympathetic ganglia and distant nerve-centres by a peculiar inhibition, all the blood-vessels and the centre of the circulatory system, the heart itself." He gives a number of cases tending to prove that frequently aural symptoms—tinnitus and deafness—accompanied by enlargement of the thyroid, are due to diseases of this latter organ, and are relievable more or less entirely by hot-water applications to the thyroid gland. This treatment relieves the congestion and stasis in this gland, as well as these conditions in the turbinates and Eustachian tube, brought about by the engorged state of the thyroid. In this way he frequently relieves tinnitus and deafness, concomitant neurasthenia being combated by proper remedies.

FERRERI (*V. Internat. Otol. Congress: Annales des Mal. de l'Oreille*, vol. xxii.) has shown that the predominant senile change in the middle ear is atrophy of the bone, particularly of the ossicula, the most important elements in the transmission of sound. In no instance (201 old persons) has he found primary lesions of the labyrinth. The deafness of old age, he concludes, is not due to changes in the middle ear similar to ordinary sclerosis, but rather to a primary lesion of the joints of the auditory ossicles, the result of trophic nerve-changes.

In the discussion following (*loc. cit*) GRADENIGO claimed that senile deafness is due to a general senile involution extending to the sound-transmitting rather than to the sound-perceiving apparatus.

POLITZER claims that the deafness of old age is due to osseous changes around the oval window, while MASINI (*loc. cit.*) agrees with the views of Ferreri as given above.

## AURAL VERTIGO AND SO-CALLED MÉNIÈRE'S DISEASE.

MACNAUGHTON JONES (*British Med. Journ.*, 1895, No. 23) describes a case of apoplectiform, labyrinthine vertigo, and limits the term Ménière's disease to such an affection. The term Ménière's symptoms may be applied to vertiginous conditions evoked by middle-ear disease. In these views he is upheld by PRITCHARD and BARR (*loc. cit*). The same suggestions were made by C. H. BURNETT in 1882 (*Philadelphia Medical Times*, June 3d).

Hyperæsthesia acustica may exist in connection with ear-vertigo, as in a case reported by MacNaughton Jones (*loc. cit.*).

LEMAIREY (*Ann. des Mal. de l'Oreille*, vol. xxi.), by the administration of pilocarpin in a case of Ménière's labyrinthine disease, abrogated the vertigo and increased the hearing. Relapses occurring one and then three years later were cured by quinine, according to the method of GELLÉ ( *Annales des Mal. de l'Oreille*, vol. xxii.). According to Gellé (*loc. cit.*), "the premonitory sensorial phenomena, either sensory or motor, of an attack of ear-vertigo show that irritations of the auditory nerve produced in man not only various perturbations of equilibrium and of movements which have been studied and are well known, but also they act upon the psychic centres and provoke veritable hallucinations of sense and motion which only clinical observation can disclose to the physician."

### OBJECTIVE NOISES IN THE EAR.

KAYSER (*Archiv f. Ohrenh.*, vol. xxxix.) divides objective aural sounds into two kinds—vascular and muscular. RANDALL (*Coll. Phys.*, Philadelphia, 1896) and CRESSWELL BABER (*Brit. Med Journ.*, 1895, vol. ii.) report cases of objective pulsating tinnitus. TOMKA (*Archiv f. Ohrenh.*, vol. xxxix.) and SCHWAGER (*Monatsschr. f. Ohrenh.*, February, 1896) report cases of objective noises in the ear, probably due to spasmodic contractions of the tensor veli muscle.

### EPILEPSY FROM EAR DISEASE.

VERDOS (*Ann des Mal. de l'Oreille*, vol. xxii.) maintains that in epilepsy *ab aure læsâ* there is a characteristic aura beginning in the auditory apparatus, as shown by him in 1891. In fact, he asserts that every epileptic in whom the aura begins in the ear should be examined by an aurist. In some cases, however, of manifestly aural epilepsy the aura does not start in the ear, but in one of the extremities. Later it appears in one ear, to which fact the patient may draw the physician's attention, as shown by Verdos. This is a very valuable diagnostic sign.

## DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

UNDER THE CHARGE OF

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### A CASE OF LYMPHADENOMA OF THE NASAL FOSSA.

In a Bordeaux Thèsis, DR. DE LA BARRIERE describes such a case (*La Pratique Médicale Journal des Maladies des Oreilles, du Nez et du Larynx*, 1896, No. 18). This neoplasm presents pretty much the same symptoms as do other malignant growths of the nasal fossa, and with a clinical history and a histological constitution identical with those of lymphadenomas of other regions. It is of neoplastic rather than of infectious origin. The prognosis is always grave, even when radical procedures can be prosecuted at an early stage.

Microscopical inspection alone permits accurate discriminative diagnosis.

### SINGERS' NODULES.

DR. EMILIO MARTINEZ reports (*Archives de la Policlinica*, 1896, No. 4) a case of vocal nodules treated by electro-cauterization. This is one of the few cases which have been observed in the male subject. A report of the case is followed by some general remarks upon the lesion.

### TUBERCULOSIS OF THE NOSE.

At a recent meeting of the British Laryngological, Rhinological, and Otological Association (*Journal of Laryngology, Rhinology, and Otology*, 1896, No. 6) DR. HILL reported a case (presumptively a male, though not so stated in the report) in a tuberculous subject with pain in the nose and an ulcerating granular tumor of the inferior turbinal, with occasional hemorrhages therefrom, thus exciting a suspicion of malignant disease; and this is the feature of the case which seems to have prompted its report. The inferior turbinal was removed for microscopical examination. It resembled a case of intranasal lupus, but the amount of inflammation was too active to accept the opinion that the disease can be of this character. The patient was doing well, but there was great tendency to exuberant granulations. The patient was twenty-eight years of age, married, and not syphilitic.

DR. PEGLER exhibited a section from this turbinal which he pronounced a rarity. The vascular sinuses and a few acinous glands were recognizable, but the latter only with difficulty. Several giant-cell systems appeared in the field, but they were not typical and the giant-cells were small. The zone of leucocytes was very discernible, however, and some of the systems were caseating in the centre, and portions of the epithelial border remained here and there, infiltrated with small cells like the rest of the tissue. There were no bacilli of tuberculosis to be found.

Dr. Hill mentioned that the diagnosis of tuberculosis must be made even though the bacillus has not been demonstrated, for, while the bulk of the growth is inflammatory, giant-cells were present, together with breaking-down nodules evidently tuberculous in nature, as determined by a number of gentlemen to whom the specimen had been presented.

### POLYPOID VEGETATIONS OF THE FRONTAL SINUS.

DR. PEGLER presented at the recent meeting of the British Laryngological, Rhinological, and Otological Association (*Journal of Laryngology, Rhinology, and Otology*, 1896, No. 6) some polypoid vegetations from a case of frontal sinus disease which were very similar to the granulation-polypi removed from the antrum, and are constituted by a very delicate granulation-tissue basis in which are distributed a large number of young and growing cells, and a capillary network ramifies in the tissue, and the growths are fringed with ciliated epithelium.

### CANINE EPITHELIOMA OF THE PHARYNX.

DR. PEGLER (*Ibid.*) exhibited a specimen in which, with the exception of a slight difference in the shape of the cells, the features presented in the section were similar to those found in the human subject.

### FOREIGN BODIES IN THE UPPER AIR- AND FOOD-PASSAGES

At the recent meeting of the Laryngological Society of London (*Journal of Laryngology, Rhinology, and Otology*, 1896, No. 6) a discussion well worth reading took place, which was participated in by DR. SCANES SPICER, MR. LAWRENCE, DR. A. A. KANTHACK, DR. LAMBERT LACK, MR. CRESWELL BABER, and others.

### ANEURISM OF ASCENDING PHARYNGEAL ARTERY.

Most all the cases of this anomaly occur in females. At a late meeting of the New York Academy of Medicine (*Journal of Laryngology, Rhinology, and Otology*, 1896, No. 6) DR. SHARP presented a case in a female patient, fifty-five years of age.

DR. WRIGHT mentioned that he had seen two cases; one in an old woman and the other in a young woman.

DR. MYLES stated that he had a case under observation somewhat similar to the one presented, in a man about sixty years of age. The vessel was straight and hard. The patient had general arterio-atheromatous degeneration.

### HAY-FEVER.

DR. SETH SCOTT BISHOP, of Chicago, contributes (*The Laryngoscope*, July, 1896, No. 1) an article on hay-fever and its successful treatment, the principal point of which is the recognition of the uric acid diathesis as a remote cause, which he combats with the administration of dilute sulphuric acid or of Horsford's acid phosphate. Topically, he recommends a camenthol inhaler—a glass tube packed with camphor and menthol.

### PHOTO-FLUOROSCOPIC PICTURES OF THE LARYNX.

In the first number of *The Laryngoscope*, a new journal published at St. Louis, Mo., July, 1896, the initial article is one on the photo-fluoroscope, contributed by DR. J. MOUNT BLEYER, of New York, the paper having been originally communicated to the Royal Academy of Medicine and Surgery of Naples, Italy, for 1896, in which he describes his apparatus and presents three photo-fluoroscopic pictures of the larynx; one with an intubation-tube in position, illustrating a foreign body in the larynx; one with an illustration of a lost intubation-tube found in the trachea and removed April 2, 1896; and a third one showing an intubation-tube which had shifted out of position into the subglottic region.

# OBSTETRICS.

UNDER THE CHARGE OF

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## Puerperal Pulmonary Thrombosis.

Lackie (*Edinburgh Medical Journal*, 1896, No. 493) reports the case of a healthy, stout primipara, who had, during pregnancy, anasarca of the lower limbs without albuminuria. Labor was not tedious, was spontaneous, and attended by very little loss of blood. The patient did well and was lifted to a couch on the eleventh day. On the twelfth day the patient walked a short distance in her room, struggled for breath, and died. Efforts were made promptly and vigorously to resuscitate her, but without avail. On post-mortem examination no abnormality was found except pulmonary thrombosis and right heart distended with clot.

Reported cases of this complication show that it occurs most often before the fourteenth day after birth. It usually follows exertion, and is sometimes not fatal when thrombosis is but partial, in many cases accompanied by peripheral thrombosis also. Beyond immediate stimulation with ammonia and ether nothing can be done for serious pulmonary thrombosis. When a puerperal patient becomes easily faint and breathless she must be kept upon her back, all exertion absolutely avoided, and her nourishment carefully administered. Mental exertion and shock are also potent factors in causing this complication.

The Editor adds to the above a brief report of the following case: A young primipara had been greatly depressed during her illegitimate pregnancy; her death had been foretold by a fortune-teller, whom she believed. She had a long, hard labor, the fœtus in breech-presentation, and a marked tendency to uterine relaxation, and hemorrhage was successfully controlled. Sixteen hours after labor she was seized with dyspnœa, syncope, and fatal coma. Auscultation of heart-sounds showed overfilling of the right heart; post-mortem examination was not obtained. Treatment was absolutely unavailing. The patient's symptoms were all those of pulmonary thrombosis and heart-clot.

## Closure of Recent Perineal Lacerations.

Apfelstedt (*Münchener medicinische Wochenschrift*, 1896, No. 25) calls attention to the importance of complete approximation of the edges of a recent tear to prevent infection from the lochial discharge. It is important that stitches should not pass through the rectal wall, as the contents of the bowel might contaminate the wound. A comparatively simple method is described and illustrated. Silk or silkworm-gut is used. Stitches are inserted through the skin perineum, being entirely buried as they are passed beneath the highest point of the laceration. These stitches are parallel, and when brought together the lacerated surfaces are joined without passing the needle through the borders of the laceration. The result is good approximation of the torn surfaces, the vaginal and (in complete tear) the rectal tissues being brought together without stitches. Good results are reported by this method.

### RUPTURE OF THE UTERUS

In the *Münchener medicinische Wochenschrift*, 1896, No. 25, BURGER reports a remarkable case of rupture of the uterus in cross-birth. As the patient could not be taken to a hospital and assistance could not be obtained, Burger could do nothing more than make version and extract the fœtus. After delivering the placenta the mother's intestines protruded through the rent in the uterus. These were replaced and the hand kept in the uterus until it contracted firmly. The rent in the uterus was tightly closed by its firm contraction, and but little hemorrhage followed.

The patient did well until the sixth day, when her husband, while drunk, had intercourse with her violently. She recovered, however, from this and was delivered of a living child nine months and six days after. The placenta was adherent to the site of the former rupture and was delivered manually. A year later the patient died of hemorrhage from adherent placenta before the midwife in attendance could summon a physician.

### FŒTAL SYPHILIS.

In the *Münchener med. Wochenschrift*, 1896, No. 19, ALBERS-SCHÖNBERG gives the results of his studies in the diagnosis of fœtal syphilis in the Leipzig clinic. He finds, in common with others, that the mere appearance of sanguinolent maceration is not proof that the fœtus perished from syphilis. Considerable increase in the weight of the liver and spleen, with increased weight of the placenta, indicates syphilis. On microscopic examination the bloodvessels of the placenta are much encroached upon by abundant growth of connective-tissue cells. Gradual occlusion of the vessels and anæmia and fatty degeneration result.

### CHANCRES OF THE BREAST.

In *La Presse Médicale*, 1896, No. 39, an interesting clinical lecture by FOURNIER is reported upon this subject. In order of frequency chancres of the breast come next to those of the lips, excepting chancres on the genital organs. They are found in both sexes, caused in men by suction by the lips of prostitutes. In diagnosis, chancres of the breast must be distinguished from herpes; while this may at first be difficult, the absence of glandular enlargement in herpes will assist. Mammary chancres in women may arise in women who are not nursing from contact of the nipples with the lips of syphilitic men. Among mothers the sore may arise from the infant or from some manipulation connected with nursing. Most infants who infect a breast are born with syphilis; a few acquire syphilis after birth.

An extraordinary number of chancres of the breast are found in women who have endeavored to pull out the nipples by suction or manipulation to assist the infant in nursing. In some villages women are found who make a practice of bringing milk from the breasts by suction when nursing is difficult. Such a woman, when syphilitic, can infect a large number of women who infect their infants, and often their husbands also.

Diagnosis is often of great importance in these cases. The most usual location of the lesion is upon one breast, without especial frequency regarding which is chosen. It most often develops at the base of the nipple, where it joins the areola; next upon the nipple, and then on the areola. It is rarely found outside these portions of the breast. Chancres of the breast have the same period of incubation as those in other portions of the body. They begin as a very slightly raised, round lesion, red or dark red in color. The centre of the lesion rapidly degenerates, and erosive action forms an excoriated surface. While it is not always possible to recognize the beginning of a chancre promptly, all such lesions should be carefully studied. Three forms of chancre are seen upon the breast: The crater, which has an excavated centre and is found on surfaces made moist by the infant's mouth when nursing; the herpetic form, in which the eruption surrounds the nipple; and, most rare, the phagedenic variety, in which loss of tissue is a marked feature. These chancres persist for several weeks, as a rule, rarely disappearing in nine or ten days. Most of them leave induration and a scar, although this is not invariably the case.

As regards the very important matter of diagnosis, it is a rule to be followed not to diagnosticate a chancre positively during the first four days after its appearance. In cases in which fissure of the nipple makes a positive diagnosis very difficult, it is best, when in doubt, to feed the child for ten or twelve days, keep up the flow of milk by the breast-pump, and study the development of the lesion. If it be chancre, it will enlarge, induration will appear, and the lymphatics will finally enlarge.

So far as prognosis of the sore itself is concerned, it does not differ from that of a chancre on any other part of the body. Syphilitic infection, when communicated through the breast, is often severe, because such women are weakened by labor or are poorly nourished. So far as spreading contagion goes, mammary chancre is most dangerous; cases are recorded where a syphilitic nurse has caused infection of seven persons and one abortion. In another instance a syphilitic infant infected a woman's breast, and fourteen persons became infected and four died. The treatment of the sore is that usually employed for this lesion.

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## Pregnancy and Labor after Extirpation of one Kidney.

Schramm (*Berliner klinische Wochenschrift*, 1896, No. 6) reports the case of a workingwoman, aged twenty-five years, who had borne two children. She requested the removal of a tumor in her right side which was increasing in size and causing suffering. This proved to be a hydronephrotic kidney, which was removed, the patient making a good recovery. Three years after she asked her physician's advice regarding marriage, and, as her general health was good and the remaining kidney performed its function well, a possible pregnancy did not seem necessarily dangerous. This subsequently occurred and was endured safely, the urine being abundant and containing no casts or kidney epithelium, but albumin only. The patient was delivered in spontaneous labor of a healthy child, and made a good recovery. But two similar cases are recorded.

## POST-MORTEM CÆSAREAN SECTION WITH THE DELIVERY OF A LIVING CHILD.

In the *Centralblatt für Gynäkologie*, 1896, No. 14, ERDHEIM reports the case of a patient, ten months advanced in pregnancy, upon whom it was necessary to make tracheotomy because of a large goitre. Some days after the operation the mother perished through a profuse hemorrhage into the trachea. As soon as life ended in the mother the child was extracted by abdominal incision, and surviving.

The most favorable conditions for success in this method of delivery are found in those cases in which the mother is not suffering from a pathological condition which can be transmitted to the fœtus. If, however, the mother be suffering from profound toxæmia, as in eclamptic cases, or from some infectious disorder, the cause which destroys the mother's life will end that of the fœtus, whether it remains in the womb or is extracted. Cases of sudden cardiac syncope offer very favorable conditions for the performance of post-mortem delivery, because infection is absent from both mother and child.

## THE DIAGNOSIS OF SEPTIC PERITONITIS.

In the *Centralblatt für Gynäkologie*, 1896, No. 12, SIPPEL reports an interesting case which bears upon the results of obstetric surgery. His patient was a woman who had a fibroid upon the posterior wall of the uterus so situated that its removal was possible without removing the womb. This was accordingly done without especial difficulty under antiseptic precautions, the abdomen being closed without drainage. The patient gradually developed a septic condition which was marked by a rapid pulse, by delirium, by icterus, and the presence of bile in the urine. The urine contained no albumin, the bowels moved, the abdomen was not swollen, and the temperature rose but slightly. Death ensued in a condition of delirium. Ten hours before death a considerable quantity of blood was taken from a vein of the arm, and carefully examined for bacteria, with a negative result. Nine hours after death post-mortem examination revealed the intestine lying nearest the pelvis injected and covered with masses of fibrin. In Douglas's cul-de-sac there was a considerable quantity of purulent serum. The posterior surface of the uterus, from which the tumor had been removed, was covered with fibrin and pus. Bacteriological examination showed in the peritoneal exudate pure cultures of the *staphylococcus albus*. Serum taken from a freshly cut surface in the uterine wound gave the same germs. Contrary to expectation, the liver was sterile.

The conditions here present were essentially those which pertain after

Cæsarean section, and hence the symptoms and findings in this case are of interest to obstetricians. The explanation given for the clinical history of the case ascribes an infection at the time of operation as the starting-point· The nervous symptoms resulted from the absorption of toxins, which are especially potent in producing a disordered condition of the liver. The practical point in the case which Sippel makes is to call the attention of his readers to the importance of removing, as soon as possible, such a focus of infection. He regrets that he did not, as soon as symptoms appeared, extirpate the uterus in his case through the vagina. He would thus have removed an infected organ and have drained the pelvis. Applying his observations to obstetric surgery, when symptoms of infection occur after Cæsarean operation, and especially after hysterectomy in puerperal cases, it would seem of the utmost importance that the uterus or the stump of the uterus be at once removed, and that the pelvis be drained through the vagina.

### Perforation of the After-coming Head.

In the *Archiv für Gynäkologie*, Band li. Heft 2, Hergenhahn tabulates forty-six cases of perforation of the after-coming head. In twenty-five of these the cranium was opened through the foramen magnum; in two the opening was through the neck; in nine, through the occiput; in three, by means of the smaller fontanelle; in four, through a lateral fontanelle; in one, through the parietal bone; and in two, by means of the base of the skull. In twenty-nine cases delivery was accomplished by traction on the breech; in nine, the sharp hook was inserted in the opening of perforation for purposes of demonstration. In these cases rupture of the uterus occurred once; the cervix was torn eight times; minor lacerations were not infrequent.

The mortality was five in the forty-six cases; one from eclampsia; from previous septic infection, two; from hemorrhage and infection (ruptured hæmatoma of vulva) and from repeated attempts at delivery and mutilation before admission to the hospital, two. Hergenhahn found that craniotomy should be undertaken as soon as the fœtus has perished in suitable cases. The head should be firmly fixed, after version, at the pelvic brim and steadied by an assistant. The cranium should be opened by some form of scissor-perforator through whatever portion is most available. The patient is then put in Walcher's position, the finger of the operator put in the fœtal mouth, and by combined traction the brain is expelled and the head moulded and delivered. The prognosis in cases requiring this operation depends on the condition of the patient before operation, many of them having been lacerated and infected by previous attempts at delivery.

### Version with the Patient in the Prone Position.

Mensinga (*Centralblatt für Gynäkologie*, 1896, No. 23) does version, placing the patient upon her abdomen, and has had good results. He thinks this method has the following advantages: The outlet of the pelvis is directed above with the patient prone, giving the operator much more room for the insertion of the hand. The operator's hand and arm are in the position of pronation, giving a better use of the muscles and tactile sense. This posture widens and opens the uterus and vagina; the contraction-ring disappears in these cases. Risk of bruising the soft parts is less with the patient in this position. The patient has a pillow under the chest, her head turned to one side, while the operator may sit beside her, using either hand for version. By this posture two dangers are minimized: tearing the uterus from the vagina and air-embolism. Patients suffer less pain in this posture. Two illustrative cases are reported in detail.

### NUCLEIN IN THE TREATMENT OF PUERPERAL SEPSIS.

HOFBAUER (*Centralblatt für Gyäkologie*, 1896, No. 17) reports seven cases of puerperal sepsis which were treated by nuclein. The results were a very prompt improvement in the general condition of the patients, a better nervous condition, and the disappearance of the icterus. Puerperal ulcers rapidly healed, foul discharges became inoffensive and purulent, while the temperature at first rose, but then fell very considerably. Patients under this treatment complained of pains in the bones and sensitive feelings about the joints. These disappeared as improvement went on. An increased amount of uric acid was excreted. If used promptly, good results were obtained.

### CÆSAREAN SECTION VERSUS TOTAL EXTIRPATION.

COE (*Medical News*, May 30, 1896) reports the case of a primipara who had a tuberculous hip, was dwarfed, and had a highly contracted pelvis, true conjugate two and three-quarters inches. She had œdema and scanty urine. She was extremely weak, and a bad prognosis was given. Total hysterectomy was done after the removal of the child; irrigation with hot saline solution and gauze drainage. The patient recovered, although her kidneys were badly damaged and she had pulmonary œdema. Her child lived a month and died of enteritis.

Coe very clearly shows the folly of allowing a patient so abnormal as to require Cæsarean section to run this risk a second time. In good hands and with patients under observation early in pregnancy, abdominal section will rarely be required; but where positively indicated total extirpation of the uterus offers many advantages.

[In the discussion of this paper before the American Gynecological Society various opinions were expressed. An earnest plea was made to apply to obstetric surgery the rules governing the operator in other branches of surgery. While patient's rights as to the preservation of organs and functions must be respected, the obstetrician should be governed by reason, and not by superstition and sentiment, which have done so much to retard the progress of obstetric science.]

### OSTEOMALACIA.

In the *Edinburgh Medical Journal*, 1896, No. 491, RITCHIE reports the case of a multipara who, after an abortion, had pains in the bones, inability to walk, with the characteristic changes in the pelvis. The removal of the ovaries was followed by speedy recovery.

# GYNECOLOGY.

UNDER THE CHARGE OF

HENRY C. COE, M.D., M.R.C.S.,

OF NEW YORK.

## Internal Administration of Ovarian Tissue.

Chrobak (*Centralblatt für Gynäkologie*, 1896, No. 20) presents the results of his experiments extending over seven years, the object of which has been to prevent or to mitigate the various disturbances following the removal of the ovaries, especially in young women. In his first case fresh or ovarian tissue from calves was administered internally. The ovary was chopped finely and given raw in doses of from twenty to thirty grains. The result was negative. Thinking that the ovaries of mature animals would be more efficacious, he had ovaries from healthy cows washed with ether and alcohol, dried, powdered, and made into pastilles, each of which contained three grains of ovarian tissue.

Seven patients were treated daily with from two to five tablets, receiving on an average twelve grains. In six cases both ovaries had been removed; the other patient, with normal genitals, was suffering from unusually severe climacteric disturbances. In one instance after two weeks' treatment the hot flushes, dizziness, etc., recurred only three instead of ten times daily, and were entirely absent at night. As soon as the treatment was suspended the disturbances reappeared. Two patients who received each twelve tablets reported that the climacteric phenomena ceased entirely, and a third that after taking twenty tablets the attacks were only one-half as frequent as before. The patient who was at the physiological menopause was similarly affected. No bad effects followed at any time. In every case the writer was careful to eliminate the factor of auto-suggestion.

While he does not claim for the remedy any positive results as yet, he thinks that it promises well. However, he believes that the best plan is to leave the whole or a part of an ovary whenever it is possible, even when it is necessary to extirpate the fibroid uterus.

Landau (*Berliner klin. Wochenschrift*, 1896, No. 25) has been employing this treatment at his clinic for several months, as suggested originally by Mainzer and subsequently by Mond and Chrobak. Cases were carefully selected, in order to control the experiments, with especial reference to the effect of the remedy upon the characteristic "hot flushes" so common at the menopause, both natural and artificial. The isolation of the active principle of ovarian tissue has not yet been effected. The writer believes that it is probably a nucleo-albumin, or perhaps an albuminous body like spermin. He used the ovaries of cows and pigs, dried at a temperature of 60° to 70° C. for twelve hours, then pulverized and made into tablets, each of which contained seven and one-half grains.

Although not prepared to present any positive results, the writer believes that the remedy does possess the power of modifying the unpleasant phenomena of the climacteric, whether physiological or anticipated, without producing any evil effects, and deserves careful consideration.

### TRANSPLANTATION OF THE OVARY.

KNANER (*Ibid.*), in a preliminary report on this subject, describes his experiments on rabbits. The animals were anæsthetized, and the strictest aseptic precautions were observed. In the first experiment each ovary was ligated with silk and excised with as little handling as possible. One ovary was then sutured to the horn of the uterus with silk, which did not include the ovarian tissue; the other was placed between the fascia and muscle, to the right of the abdominal wound, the latter being then closed with tier-sutures. In the second experiment two rabbits were operated upon in a similar manner, the ovaries being all attached to the uterine cornua.

One rabbit died six months after the operation. The ovary attached to the uterine cornua was perfectly nourished, and on section contained normal stroma and ripe ovisacs with ova, as well as young follicles in the process of development. Microscopical examination of the ovary which had been placed between the layers of the abdominal wall showed that at least one-third of the gland was well nourished by newly formed vessels and contained numerous ovisacs. In two other rabbits the condition formed several months after operation was practically the same; *i. e.*, the ovaries were atrophied, but still contained a considerable amount of normal tissue and were undoubtedly functionally active.

The following deductions are made from these experiments: 1. In rabbits the ovaries may be transplanted to localities distant from their normal site. 2. They may be attached to the peritoneum or placed between muscular tissue. 3. Ovaries thus transplanted are not only nourished, but continue to develop Graafian follicles, which ripen and probably discharge their ova. The writer states that he intends to extend his observations to other animals, and also to transplant ovaries from one individual to another, noting especially whether fecundation follows the operation.

### HERNIA OF THE OVARY IN AN INFANT.

LOCKWOOD (*British Med. Journal*, June 13, 1896) reports the following interesting case: A female infant, aged six months, suddenly became ill, drawing up its legs as if suffering from severe abdominal pain. Two days later a swelling was noticed in the right inguinal region, tender, and disappearing on pressure. When brought to the hospital an examination of the little patient showed a tense, oval swelling, three inches long and an inch and a half broad, the skin covering it being inflamed. There was no impulse on crying. Obstinate constipation and occasional vomiting were present, but flatus and later fecal matter were passed. The diagnosis of strangulated inguinal hernia was made. On incising the swelling a quantity of dark grumous fluid escaped, and a mass appeared which was at first supposed to be the cæcum, but proved to be the fimbriated end of the Fallopian tube and a hemorrhagic ovary, the pedicle which emerged from the internal abdominal ring being twisted half around its axis, but not constricted at the ring. The pedicle was transfixed and tied, the tube, ovary, and sac excised, and the stump attached beneath the internal oblique and transversalis muscles. The inguinal canal was sutured and the external wound closed with silkworm-gut. The patient's convalescence was normal. The cause of the torsion was obscure, but was probably due to the fact that as the ovary and tube slipped through the internal ring, the ovary lay in front of and above the tube and slipped down in front of it, thus producing the twist. A similar case has been reported by Owen.

### SEVERE HEMORRHAGE FOLLOWING COITUS.

CHALEIX (*Gaz. Heb. de Méd. et de Chirurgie*, 1896, No. 45) reports the following cases:

CASE I.—A young woman, aged twenty-two years, gave the history of a "bleeder." The first coitus was not difficult, but was followed by such profuse bleeding that it could not be controlled by compresses. On examination the patient was found to be pale and cold, with a feeble pulse. The hymen was torn in two places, and behind it on the posterior vaginal wall there was an erosion the size of a franc; free oozing from the raw surface persisted, but was controlled by a gauze tampon. Intercourse subsequently took place without a recurrence of the bleeding, but following her accouchement the patient had a severe hemorrhage.

CASE II.—A strong, healthy woman, twenty-four years of age, suffered severe pain at the first matrimonial approach, so that the act could not be completed. There was no hemorrhage. The attempt was uusuccessful until the fourth night, when intromission occurred, attended with great suffering and free hemorrhage, which continued all night. It was checked with a hot vaginal douche, but recurred and continued for several hours until the patient was completely exhausted. On examination it was found that the blood came from tears in the posterior wall of the vagina, which was more contracted than normal. The bleeding was controlled by a tampon. Coitus was afterward performed without difficulty; the patient became pregnant, and had a normal confinement.

CASE III.—A vigorous woman, aged thirty years, married to a husband considerably younger than herself, suffered so much pain at the first coitus that she fainted. There was such profuse hemorrhage that the bed was soaked. On examination a spurting vessel was seen at the posterior edge of the hymen, and there were several bleeding surfaces in the posterior vaginal wall. The entire hymenal ring was torn away at its base. The vessel was ligated and the vagina tamponed with gauze, when the bleeding was arrested.

### NECROSIS IN UTERINE FIBROMYOMATA.

HARTMANN and MIGNOT (*Annales de Gynécologie et d'Obstétrique*, 1896, No. 6) report a fatal case of general suppuration and necrosis of a uterine fibroid which they attributed to infection by anaërobic microbes. The latter appeared in the form of short bacilli, frequently joined together, which were found in large numbers on the surface of the uterine mucosa as well as in the pus within the tumor. Identical forms have been found in the pus from a suppurating cyst of the vagina, in abscesses of Bartholin's glands, and also in abscesses of tubal origin. The writers infer that in the case reported infection took place through the lymphatics extending from the endometrium to the capsule of the tumor. It was carefully studied, because it seemed to throw some light upon the question of the etiology of necrosis in these growths.

### CALCIUM CARBIDE IN INOPERABLE CARCINOMA.

GUINARD (*Sem. Méd.*, 1896, No. 18) reports several cases in which he used local applications of this remedy, which has both a caustic and a hæmostatic action. A fragment about the size of a marble is applied to the diseased surface and is kept in position for four days by a tampon of iodoform-gauze, when the latter is removed and a douche given. Some pain is caused during the first few hours. Pain is relieved, hemorrhage and foul discharges are checked, and the affected surface becomes dry and smooth.

### DERMOID CYST IN AN INFANT.

SANT ANNA (*Ibid.*) reports a successful case of ovariotomy in an infant, one year old, in whom the tumor had reached an appreciable size seven months before. It proved to be a dermoid cyst weighing two pounds. The recovery was uneventful.

Nine other cases are reported in which the ages of the patients varied from twenty months to seven years, four terminating fatally.

Discussing the question of operative interference in cases of abdominal enlargements in young children, the writer urges the propriety of an explorative incision rather than puncture, since the prognosis is absolutely bad unless something is done; and, if the abdomen is opened, it may be found that the growth is of ovarian origin and can be safely removed, while the mere exploration may be curative in tuberculous ascites.

### SUPPURATION IN OVARIAN CYSTS.

BOUILLY (*La Gynécologie*, June, 1896), in a clinical paper on this subject, devotes considerable space to the question of etiology. Owing to the infrequency of tapping at the present day, it is rare that a cyst becomes infected from without. Infection usually comes from an adjacent septic focus, either through the lymphatic channels or bloodvessels, or by direct continuity through the medium of new-formed adhesions. In cases of suppuration of the cyst-contents following labor septic germs are doubtless conveyed through the lymphatics of the broad ligaments from the infected endometrium.

The writer has never observed a case of suppuration which could be attributed to coitus during menstruation, as suggested by Mangold. Infectious general diseases may serve as etiological factors. Two cases of suppuration following typhoid have been reported by Werth, in one of which the characteristic bacilli were found in the cyst-contents. Here the infection is doubtless through the medium of the circulation.

In many cases the cause of the suppuration is unknown, especially in dermoids, so that Mangold has advanced the hypothesis that it may result purely from chemical changes in their contents. Infection of ovarian cysts may be distinguished as saprophytic, due to the presence of saprophytic staphylococci, bacterium coli, etc., and septic, caused by pyogenic micro-organisms, such as the streptococcus pyogenes, gonococcus, bacterium coli commune, and typhoid and tubercle bacilli. The clinical symptoms and prognosis are much graver in the latter case, being those of general as contrasted with those of local infection.

## UTERINE CARDIOPATHIES.

KISCH (*Gaz. de Gynécologie*, June, 1896) calls attention to the reflex cardiac disturbances observed in women at certain crises in their lives—at puberty, at the menopause, just after marriage, and also during pregnancy and labor. These are palpitation, abnormal acceleration and slowness of the pulse, præcordial pains, dyspnœa, sense of oppression, etc.

In young subjects with these symptoms the external genitals may be non-developed; menstruation is established with difficulty, and is scanty and irregular. When these women reach the climacteric they have a return of the same phenomena which appeared at puberty, especially if they have been weakened by several previous labors and profuse hemorrhages. Simultaneously with the cardiac disturbances they are troubled with marked gastric irritability.

These cardiac neuroses are undoubtedly due to the physiological changes in the ovaries at puberty and the menopause, though they may be attributed to certain chemical changes which occur during the development and atrophy of the Graafian follicles. The condition is doubtless one of hyperæsthesia of the cardiac plexuses.

To some extent these cardiopathies seem to be hereditary, and are observed most frequently among the better classes.

The treatment recommended is hygienic and moral, rather than medicinal.

## TRUE AND FALSE CAPSULES IN OVARIOTOMY.

In a short but most instructive paper on this subject DORAN (*British Medical Journal*, April 18, 1896) points out the anatomical difference between real and apparent encapsulation of ovarian cysts, and shows how important it is for the operator to recognize the true condition before beginning the enucleation of the sac.

In the case of an intraligamentous cyst the capsule consists entirely of the mesosalpinx, and presents a dull-red capsule which moves freely over the cyst-wall. After tapping, the sac can be drawn out readily and a pedicle can be obtained without enucleation. This is to be distinguished from false encapsulation, in which the cyst is firmly adherent to the floor of the pelvis and to the posterior layer of the broad ligament, and is covered with a pseudo-capsule, with the tube apparently lost on its surface, as in the former case; but here the uterus is flattened against the anterior aspect of the tumor, instead of being pushed over to the opposite side. The anatomical relations are apparently identical with those in the former case, and the surgeon often finds out his error only after removing the cyst and finding that no capsule remains, while the tube and mesovarium are intact.

The important practical point is that if the intraligamentous development of the growth is recognized at the onset, the surgeon can begin the process of enucleation cautiously, working between the folds of the broad ligament, and thus avoiding important structures, instead of lacerating the peritoneum and injuring ureters or larger veins by trying to tear up a cyst which he erroneously supposes is bound down in Douglas's pouch. Moreover, the after-treatment of the true capsule (by suturing or drainage) will be entirely different from that of a case of false encapsulation.

### RETROFLEXION DUE TO AMPUTATION OF THE CERVIX.

GOTTSCHALK (*Deutsche med. Wochenschrift*, 1896, No. 18) reports several cases to support his assertion that amputation of the portio vaginalis is resorted to too frequently, since the operation not only often fails to meet the indications, but is even productive of harm by establishing a true pathological condition. In the five cases reported retroflexion afterward developed, the uterus being previously in a normal position. He attributes this condition to the fact that with the removal of the portio the relations between the cervix and corpus uteri are changed, and at the same time cicatrices are formed anterior to the stump, which tend to draw it forward and thus to throw the fundus backward. Unfortunately, these cases cannot be treated by pessaries, and the cicatricial contraction often gives rise to so much disturbance that subsequent ventrofixation becomes necessary.

The writer states that in the rare instances in which he now amputates the cervix he performs partial amputation only, so that the portio shall retain its normal length.

### THYROID EXTRACT IN THE TREATMENT OF UTERINE FIBROIDS.

JOUIN (abstract in *La Gynécologie*, June, 1896), having had occasion to administer thyroid extract to a stout woman for the purpose of reducing her weight, noticed that not only was the obesity diminished, but a large uterine fibroid which extended above the umbilicus rapidly lessened in size until it attained only one-fourth of its former dimensions.

He accordingly selected seventeen cases of fibroids, which were treated by the internal administration of thyroid, with the following results: In twelve cases in which hemorrhage was a marked symptom there was a noticeable diminution in the size of the tumor, while the hemorrhage practically ceased; of five large tumors, in feeble subjects, two were decidedly affected, two but slightly, and one not at all.

Five other patients with profuse menorrhagia attributed to the climacteric, two with bleeding due to carcinoma, and one with an intrauterine polypus were treated with the same remedy.

The writer concludes that thyroid extract does cause a marked reduction in the size of uterine fibroids, while the symptoms—pain, pressure, general weakness, and especially hemorrhage—are certainly relieved. Moreover, it causes a diminution of the menorrhagia in women at the climacteric.

# PÆDIATRICS.

UNDER THE CHARGE OF
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ASSISTED BY
THOMPSON S. WESTCOTT, M.D.,
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## PALSY OF OCULAR MUSCLES IN HEREDITARY SYPHILIS.

ZAPPERT (*Archiv f. Kinderheilk.*, Bd. xix. S. 161) relates a rare example of ocular palsy as the sole manifestation of hereditary syphilis. A girl of five years was brought for consultation because of a strabismus which had suddenly appeared after an attack of headache, vomiting, and prostration.

Examination showed complete ptosis of the left upper lid. The left globe deviated to the temporal side, causing a divergent squint, its voluntary excursus being limited to outward and slight downward movements. The pupil was moderately dilated, larger than its fellow, presenting a paralysis of accommodation and not reacting to light. The right eye was normal. There were no stigmata of syphilis and no visceral lesions. The mother, however, had been under treatment for syphilis years before. In view of this fact the child was submitted to specific treatment, and was cured completely in three months.

According to the author, the ocular palsy might be caused by a gumma of the brain, a basal meningitis, or a neuritis of the oculomotor; and he finally decides upon the last.

## SUPPURATIVE ARTHRITIS DUE TO THE GONOCOCCUS IN A NEWBORN INFANT.

GRIFFON (*Presse Médicale*, 1896, No. 15) reports the case of a newborn infant suffering from a double purulent ophthalmia with perforation of the cornea, in whom purulent arthritis of the right hip and wrist-joint was afterward observed. Under treatment the articular lesions improved, but the child succumbed to an infectious diarrhœa. Bacteriological examination during life gave the following results: 1. In the liquid obtained by puncture from the hip-joint numerous leucocytes and a few microbes, staphylococci and probably gonococci, were observed. Cultures gave the staphylococcus albus. 2. The conjunctival pus contained gonococci, staphylococci, and a special bacillus, the latter two only yielding cultures. 3. The vaginal secretions contained gonococci and staphylococci. 4. Several examinations of the blood gave negative results. After death pus from the hip- and wrist-joints showed diplococci having all the characteristics of gonococci. Cultures showed staphylococci and the special bacillus found in the ocular and vaginal pus. Blood taken from the heart was sterile.

### A CASE OF ERYSIPELAS NEONATORUM CURED BY ANTISTREPTOCOCCIC SERUM.

ERNEST A. T. STEELE (*British Medical Journal*, December 7, 1895) records a case of extensive erysipelas in a child aged three weeks cured by antistreptococcic serum. The disease began at the umbilicus, which was not yet healed, spreading downward over the hypogastric and iliac regions, buttocks, and upper part of the thigh, involving also the penis and scrotum. After the first injection of 6 c.cm. of Ruffer and Robertson's antistreptococcic serum the child began to take the breast, looked better, and the redness ceased to extend and lost its defined margin. Another injection was given at the end of twenty-four hours, and a third, of 5 c.cm., two days later. Five days later the child was well, excepting for a slough of the scrotum. The ulcer soon healed. The author has never seen a case recover when the disease was so far advanced as in this one. No other treatment of any kind was adopted.

### DIAGNOSIS AND TREATMENT OF DIPHTHERIA.

HILBERT (*Deutsch. Archiv f. klin. Med*, March 26, 1896) discusses exhaustively the bacteriological diagnosis of diphtheria and the results of the serum-treatment. He deprecates any tendency on the part of physicians in private practice to leave the use of antitoxin to hospitals. As a usual thing, a diphtheria-patient has been sick several days before being sent to a hospital, and, as pointed out by Behring [a point which needs to be repeated with emphasis until it is universally understood], the chances for a favorable effect of the antitoxin are so much the better the earlier it is injected. The theoretical foundation of this postulate is plainly seen, if, as is accepted by the highest authorities, the Loeffler bacillus be the cause of diphtheria and produce its effects through a toxin. An early injection of antitoxin will neutralize some of the toxin already absorbed, preventing any further deleterious effect from that amount of toxin and enabling the system to overcome the infection so much earlier than would otherwise be the case. To allow of an early injection an early diagnosis is desirable. In typical cases this, of course, is easy: it is difficult in mild cases and in some cases of lacunar angina, which differ clinically from diphtheria only in their benign nature as regards termination and sequelæ and in their occurrence more commonly in adults. While the direct examination of a cover-glass preparation often gives good results, much greater accuracy is obtained through a culture, the preferable medium being Loeffler's sugar-bouillon blood-serum, although glycerin-agar may be used. The pseudo-diphtheria bacillus may give rise to uncertainty in some instances; but this, as described by Loeffler, in comparison with the true, is shorter and broader, grows more luxuriantly on agar, does not render bouillon acid, and has no virulence. It has been found to be of sufficient clinical accuracy to base a judgment on the morphological and cultural appearances, having recourse only rarely to a test of the virulence toward guinea-pigs.

With regard to cases of mixed infection Loeffler pointed out in his earlier publications that the diphtheria-bacilli were associated with many other micro-organisms, especially streptococci. Roux and Funk have shown that the diphtheria-bacilli seem to be more virulent in the presence of streptococci, or at least that animals so infected do not always recover under the use of antitoxin, " because," as Roux says, " the cells struck by the streptococcus-toxin no longer respond to the stimulation of [the diphtheria] antitoxin." As it is rare to obtain a pure culture of the bacilli from a case of diphtheria, it is well to know when to consider a case one of mixed infection. Bacteriologically, this occurs when the cocci have invaded the internal organs or have set up cervical abscess or broncho-pneumonia. Clinically, " septic diphtheria " does not always coincide with the above, as Genersich has shown. It speaks well for the serum-treatment that the secondary streptococcus infection occurs so much less often the earlier the antitoxin is injected.

In reviewing the reported results of this treatment, a table compiled from reports of 100 or more cases treated in hospitals, and including 6000 cases in all, showed a lowering of mortality, as compared with preceding years, of about 20 per cent. The opponents of the treatment claim that two factors produced this lowering—a mild epidemic and an increase in the number of cases sent to hospitals. The first objection loses all weight in the light of Baginsky's experience when the supply of serum was exhausted, and in the universal coincidence between a low mortality and the use of the antitoxin. That more cases were admitted to the hospitals is also untrue, according to the table compiled by Behring for Berlin, showing that the percentage of hospital-cases to the total number of cases has grown less since 1892.

Collected reports of 400 cases occurring in private practice show a mortality of 7.9 per cent. Another table compiled by Behring shows that the decrease in the mortality in Berlin (where the antitoxin has been extensively used) has been not only relative to the total number of cases, but also absolute; so that while the cases for 1894 exceeded those of 1893 by 1000, the deaths in 1894 were nearly 100 less; and the indications for 1895, gauged on the first six months, were that the reductions would amount to several hundreds, the total number of cases still showing an increase over those in 1894.

The author reports 40 cases of diphtheria treated with antitoxin, mortality 2.5 per cent. (the only fatal case being moribund at the time of injection and dying in fourteen hours); and 23 cases without antitoxin, mortality 13 per cent. The cases are thoroughly studied from every point of view and reported in detail.

### Treatment of Pneumonia in American Children's Hospitals.

In the *Archives of Pediatrics*, April, 1896, are to be found reports from six children's hospitals in the leading cities of the United States, outlining their methods of treating pneumonia in children.

At St. Mary's Free Hospital for Children, New York, according to Swift, broncho-pneumonia is treated in a room warmed to 75° or over; a kettle of water is kept boiling, upon which a vessel containing creosote or pine-needle oil is kept constantly steaming. For restlessness, pain, or excessive cough, one to three grains of Tully's powder is given and repeated according to effect. Sometimes, where secretion is very copious and watery, nitroglycerin is used with much freedom. Alcohol is freely used in these cases, and sometimes strychnine. If an expectorant is needed, ammonium chloride is preferred; and when cough persists some preparation of creosote is used. Externally the chest is rubbed with camphorated oil or turpentine and oil. Lobar pneumonia is treated on a different principle. Besides the usual hygienic treatment the author gives all cases calcium chloride in doses of 2 to 5 grains every two or three hours. For relief of pain and excessive cough Tully's powder is given; and for quiet and sleep, occasionally phenacetin or sulfonal. High temperature is controlled by sponging, the cool bath or graduated bath, and occasionally, in cases that bear it well, by phenacetin.

In the Babies' Hospital, New York, where only cases under three years of age are received, says HOLT, about one-fourth are lobar cases and three-fourths broncho-pneumonias. The children are kept in an airy ward by themselves at a temperature of 70° F. Great care in dieting is taken at once; and if fermentation in the colon is noted, the bowel is emptied daily by irrigation. Expectorants are almost entirely discarded. For restlessness phenacetin or codein. High temperature, when attended by extreme nervous symptoms, is controlled by cold in one or other of the various forms of using this agent. Counter-irritation is made by means of a paste of one part of mustard to six of flour, left on the chest for five or six minutes at a time, repeated three to eight times daily. Steam-inhalations are used systematically in a tent, creosote, turpentine, or benzoin being vaporized at the same time. Whiskey is the main reliance as a stimulant, with strychnine and at times nitroglycerin. The oil-silk jacket is worn throughout the attack.

At the Children's Hospital, Philadelphia, GRIFFITH reports, the cotton-jacket is used by some of the staff, but has been discarded in his own practice. Hot-jacket poultices are occasionally used when there is pain or dyspnœa; counter-irritation by turpentine or amber oil. The coal-tar anti-pyretics are rarely used, and digitalis and strychnine are reserved until the circulation demands them. Digitalis, especially, is often pushed beyond the usual limits. Alcohol is not used as a routine treatment, but when indicated is given in proportionately large doses.

At the Children's Hospital, Boston, says BUCKINGHAM, in a paper treating only of the lobar variety, poultices are never and the jacket rarely used. Brandy is used more than all other stimulants, though digitalis and strychnine are employed where there is a weak heart.

At the New York Foundling Hospital, NORTHRUP writes, the patients are under two years. For localized pain he uses intermittent poulticing with one part of English mustard to three or four parts of flaxseed; internally opium is given. High temperature is treated by sponging or more decided hydrotherapy. As stimulants, strychnine, whiskey, digitalis, and nitroglycerin—the latter when there is a tendency to duskiness of the ears, lips, or nose.

At the Children's Hospital, Washington, according to ADAMS, the cotton-jacket is worn throughout an attack of croupous pneumonia. Dry cups followed by hot poultices are used to relieve pain and surface-congestion. Temperature is controlled by sponging or the graduated cold bath. Anti-pyretics are avoided, but quinine by the mouth is sometimes used. Ammonium carbonate and whiskey are judiciously pushed when indicated, and later camphor, nitroglycerin, strychnine, and sometimes ether are used, the latter three sometimes by hypodermic. Ammonium chloride is sometimes given after crisis. In broncho-pneumonia the treatment is much the same, and in mild cases little is required. In more extensive inflammations counter-irritation by mustard pastes, turpentine stupes, or camphorated oil is employed, and poultices in intense or general pulmonary congestion. Ammonium carbonate is given as a stimulant and expectorant, and nitroglycerin as a cardiac stimulant is strongly advocated, but other stimulants are cautiously ordered.

### Lesions of the Kidney in Athrepsia.

Simmonds (*Deutsches Archiv f. klin. Medicin*, 1896, Bd. lvi. p. 385) reports the results of examinations of the kidneys of 60 athrepsic infants who had succumbed without presenting respiratory or digestive disturbances. In all cases the kidneys showed the existence of a parenchymatous nephritis with lesions of the epithelium of the urinary tubules. In explication of the etiology of this nephritis the author states that the gravity of the renal lesions had no relation to the gravity and duration of the athrepsia; and he thinks that the disturbance of nutrition was altogether secondary. The terminal broncho-pneumonia, or the profuse diarrhœa, either of which was present in only a few cases, was likewise excluded. He finally attributes the nephritis of athrepsia to a constant complication of the condition, namely, otitis media. Of 133 cases of athrepsia examined after death, 128 were found to have purulent otitis media; and of the 60 cases forming the basis of his study, such an otitis was present in all. Cultures of this exudate showed the presence of many bacteria, among which were the pneumococcus of Fränkel, the pneumobacillus of Friedländer, the streptococcus, staphylococcus, bacillus pyocyaneus, and others. These micro-organisms were found also in the kidneys. The author, therefore, concludes that the nephritis found in nearly all cases of athrepsia is, in the majority of instances, dependent upon a coincident otitis media.

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# THE SURGICAL TREATMENT OF FOCAL EPILEPSY.[1]

## A CRITICAL ANALYSIS OF THE RESULT IN NINETEEN CASES.

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During the past six years we have attempted to decide in a thoroughly unbiased fashion the results of the various surgical procedures adopted for the cure, or relief, of partial epilepsies. The term, partial or focal epilepsy, is used advisedly in order to include not only the cases of traumatic origin, but those as well in which localized convulsions are associated with other diseases, more particularly with early infantile cerebral palsies. However different the etiological factor in these two groups of cases may be, they have at least this in common—that a circumscribed cortical lesion is the cause of the epilepsy. The results to be recorded in this article are based upon nineteen cases. The list includes ten which were discussed in a brief paper published by us in The American Journal of the Medical Sciences, November, 1892. At the conclusion of that article we stated that the prospects were "rather gloomy, and that the successful cases will probably be those in which there was some tangible organic lesion which has been removed at a very early period, or those cases in which, after traumatic injury to the skull, trephining has been done before the effect of the depression of the skull has resulted in the development of epilepsy." The experience of later years has taught us that this statement was a just one, and that the views then expressed still hold good; but we have gradually been convinced that if the cases for operation are selected more carefully, and if the surgical technique is perfected, the prognosis need not be stated quite so gravely, and that it is possible not only to relieve many, but to cure *some* of the cases of epilepsy.

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[1] Read at the meeting of the American Neurological Association, June, 1896.

In Europe and on this continent the results of the surgical treatment of epilepsy have been pictured in rather depressing colors.[1] It is for the purpose of combating the tendency to cry down surgical interference in epilepsy that we wish to present the critical analysis of the results in a large series of cases. It is well to be extremely sceptical in the discussion of this question, yet we should remember that we are dealing with one of the saddest afflictions of mankind ; and if only a small percentage of these unfortunate individuals is improved, the gain is a great one, more particularly since the operative procedures, if properly carried out by competent men, are not serious—at least are not apt to be fatal. In only a single one of the cases operated on by Gerster could the death be attributed directly to the operation, and in this (Case 15) the operation was the third one performed upon the patient, and the loss of blood upon incising the old and thickened scar was in all probability the cause of death. In two other cases the death was not to be attributed to the operation, for the one patient (Case 17) died several months later, and in this instance a cyst underlying the entire hemisphere was encountered, the fatal termination being the result of the gradual draining away of an enormous amount of cerebrospinal fluid. The third patient was doing extremely well after the operation, but on the removal of the dressings by an interne of the hospital some weeks after the operation a septic meningitis was set up, to which the patient succumbed (Case 18).

Although it would be extremely desirable to analyze the results of operations for epilepsy as recorded by a large number of authors, the attempt to do this is of very little value. Dr. Wiener was kind enough to analyze all the operative cases reported in the *Index Medicus* for the year 1893. From among these only a very few were reported in such a fashion that any inference could be made from the results obtained. Mason[2] also has been compelled to exclude thirty-eight of seventy cases for the simple reason that the authors had recorded their cases before a sufficient period of time had elapsed after the operation. It is the entire lack of careful analysis that makes so many records and statistical inquiries absolutely worthless.[3]

A few years ago we were of the opinion that it was justifiable to make an early report of the negative result in those cases in which the epileptic attacks returned very promptly after the operation; but even this procedure is not absolutely correct, for in several instances a decided improvement set in later on. We wish particularly to emphasize the fact that the return of attacks in the first few days after the operation does by no means prove that the surgical procedure adopted has been a failure. On the whole, the judgment of many physicians seems to have been warped with respect to this question. A number of authors have insisted that the claim to surgical success shall be denied in all those cases in which sedatives have been given after the operation. It is certain that every physician would insist upon the administration of bromides or opium or chloral after any serious cerebral operation—*e. g.*, the incision of a cerebral abscess, etc.; but in the case of epileptic patients, whose brain is characterized by unusual excitability, the demand is made that such drugs shall not be administered, and apparently for no other reason than that of being able to decide whether the improvement is actually due to the operation or due to the drugs administered. But, as physicians, we have a duty not only toward science, but above all toward the patient; we have thought it, therefore, to be of the greatest importance after every cerebral operation to keep the brain at rest for a period of at least a week or two. If, after the lapse of weeks or months, the epileptic attacks have been diminished in number, it can hardly be claimed that the drugs administered during the first week or two, or possibly for a longer period, have had anything to do with the ultimate result, except that they have helped to diminish the shock of the operation.

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[1] *Cf.* Bergmann: Berl. klinische Wochenschr., April 22, 1895. Eulenburg: ibid., April 15, 1895. Jolly: Charité Annalen, Jahrgang xx.

[2] Medical News, March 21, 1896.

[3] A brilliant exception to this is offered by the work of A. Broca and Maubrac (Chirurgie Cérébrale) which has just come into my (Sachs') hands after the above was written. It is a particular satisfaction to note that our conclusions are largely in accord with the conclusions reached by these authors, who have not merely piled up statistics, but have analyzed with a great deal of discrimination the reports made by the surgeons and neurologists of Germany, France, England, and America.

We are ready to agree with those who insist that no case of epilepsy can be said to be cured unless the patient has been entirely free from all attacks for a period of at least one year. Possibly this period should be extended even to three years. But, on the other hand, it is neither just nor prudent to put every negative case in evidence against the utility of operative interference. Let me recall the interesting case of Jolly (*loc. cit.*), referring to a patient who had been addicted to alcoholism for many years and who had sustained a severe subdural hemorrhage during the first operation, which was attempted for the relief of epilepsy. Knowing the importance of alcohol as an etiological factor in epilepsy, we cannot expect surgical interference to cure epilepsy as readily in persons subject to this special habit as in those who have never been addicted to it.

We are willing to concede that surgical procedures will avail but little in the majority of cases; for that very reason it is all the more important that we should endeavor to select the few cases in which recovery is possible. In order that we may be able to formulate an opinion on this subject, we have concluded that it will be best not only to report successes or failures, but carefully to record all cases observed by ourselves and to tabulate them in such a way that the reasons for success in some and failure in others will become apparent.

But before we discuss the results obtained by us, a number of mooted points must be briefly considered. Trephining may be said to be the classical form of surgical interference in the treatment of epilepsy; but with the greater skill attained in cerebral surgery, incision of the dura, removal of old scars, and, above all, excision of diseased cortical tissue, have been practised. The effect of simple trephining in the case of depression or other injuries to the skull can be readily explained. If it does nothing more, it serves to loosen old adhesions or to diminish locally increased pressure. If a cystic condition exists, as is so often the case after traumatic injuries and in the epilepsies associated with cerebral infantile palsies, the good results following upon trephining can be easily understood. The operation *per se* may have a good effect in some cases; but I cannot go the length to which some German authors have gone in supposing that the good effect of surgical procedures in many of these cases is simply due to suggestion. The theory of suggestion will certainly not be able to bear this additional charge.

Horsley's proposition, to excise the diseased cortical tissue, is based upon sound physiological reasoning, for we must suppose that from the primary focus of disease secondary changes take place which lead to the development of epilepsy. The success of this method has not been so great as might have been expected; but it is easy enough to find the explanation for this if we study the morbid changes in the brain underlying chronic epilepsy.

Following upon traumatic injury to the skull or brain, a circumscribed meningo-encephalitis is often engendered, sometimes due directly to the impingement of a spicule of bone, at other times due to hemorrhage occurring at the moment the injury is inflicted. If the hemorrhage has been a very copious one, it may lead later on to the formation of a cyst. This circumscribed meningo-encephalitis may be recognized in some instances without incision of the dura; but in other cases it is revealed only after a microscopical examination of the excised tissue. This has been brought out very distinctly in the articles of Coen[1] and of Van Gieson.[2] The latter has insisted on the occurrence of adhesions between the pia and the cortex, of a chronic degeneration of the pyramidal cells, and of an increase in neuroglia-tissue. Similar conditions have been found in three cases of ours which are to be specially reported upon by Drs. Collins and Wiener.[3] As a point of practical importance it is well to insist that, if the symptoms have pointed to the necessity of an excision of the tissue, such excision should be performed even if at the time of operation the cortical tissue appears to be normal.

The true pathology of partial epilepsy is not exhausted by the study of small portions of the brain excised during an operation. A number of years ago we called attention to the fact that the investigations of

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[1] Ziegler's Beiträge zur Path. Anat. u. Phys., 1888, vol. ii. p. 107.

[2] New York Medical Record, April 24, 1893.

[3] To be published in Brain.

Féré, Chaslin, and others prove that a general sclerosis emanating from the focus of disease is apt to be developed in the cortex. If we excise the focus, the sclerosis will still remain, and these sclerosed and degenerated fibres will exert an epileptogenic influence upon other portions of the hemispheres. An interval, varying between several months to two years, elapses before this sclerosis is fully developed, and a similar interval exists between the time of the original injury and the first occurrence of the epilepsy.[1] Such reflections as these justify the excision of the focus of disease before the development of a widespread sclerosis has taken place. Moreover, we can also understand why an excision of tissue many years after the traumatic injury is bound to be of but little avail. Another disadvantage is this: that after the excision of tissue a scar may be developed which may act as an irritant and may produce epileptic seizures.

The method of treating epilepsy by excision of cortical tissue has still another drawback. If the focus of disease is in the motor areas, excision of such tissue will be followed by paralysis. This paralysis is, however, of a transitory nature, not only in children, but also in adults. This was made evident particularly in Case 19, in which we had performed a total excision of the arm-centre in both hemispheres, and yet there was merely a temporary paresis of each upper extremity for a few days after the operation. At present this patient has control over both extremities as before. This experience throws a rather queer light upon the theory of the localization of centres in the cortex. In several of our patients the paralysis after excision lasted so short a time that it could hardly be considered a disadvantage. This disturbance of function, indeed, was so slight that one is compelled to assume that the diseased area had ceded its function to neighboring and healthy portions of the cortex. The probability of this is emphasized by the fact that in two patients operated upon the palsy did not appear until several days after the operation, at a time at which we may suppose that the tissue bordering upon the diseased area had been slightly affected by the surgical procedure. We trust that this observation will be corroborated by others. If the diseased area is situated in one of the sensory portions of the hemispheres, as is not infrequently the case in traumatic epilepsies, hearing or sight may be permanently impaired. The exact result of excision under such circumstances has not yet been determined, for we have not had the courage to practise excision of any sensory portion of the cortex. On physiological grounds, however, it is safe to say that absolute blindness or deafness would not result from the removal of any such area. In the following tables we propose to give the chief points of the histories of the nineteen cases operated upon by Gerster.

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[1] These views have been substantiated by the recent work of Muratow (Deutsche Zeitschrift f. Nervenhlk., vol. viii. p. 97). This author has attached special importance to the degeneration of the association-fibres, and insists that the epileptic irritation is conducted by these association-fibres and keeps the neighboring cells in a condition of permanent hypertonia.

## GROUP I.—CASES CURED BY OPERATION.

| No. | Name, sex, and age. | Abstract of history. | Interval between trauma or beginning of disease and operation. | Interval between beginning of epilepsy and operation. | Date and character of operation. | Course after operation. | Remarks. |
|---|---|---|---|---|---|---|---|
| 1 | O. E.<br>M.<br>44 | Journalist; married 2 yrs. In 1883 made a trip from New York to Philadelphia in a condition of alternating consciousness; did not realize where he was until he reached Philadelphia; otherwise has always been healthy. In May, 1892, fell from a bicycle; was totally unconscious for 4 days, but recovered completely within 10 days. After 8 weeks was able to do his work. No symptoms of paralysis at any time. 6 months after the fall had left-sided convulsions, several attacks each week; since 2 months repeated general convulsions, with loss of consciousness, etc. Painful swelling and scar in the right fronto-parietal region. | 1 year. | 6 months. | May 26, 1893, trephining and removal of depressed portion of skull; trephine-opening about 4 cm. in diameter. Removal of adhesions between the thickened dura and bone. Brain pulsates; brain aspirated; no cyst found; Trephine-opening not closed. | Made excellent recovery; after 13 days was dismissed from hospital. Had only one very mild spell in Nov. 1893; in May, 1894, had a fainting-attack, without convulsions, after excessive work, but since that time has been absolutely well. | Up to June, 1895, had been taking small doses of tincture of opium, 5 to 10 gtt. at night, but since that time no medicine. In 2, possibly 2½ years, no spell. Patient has written a letter in April, 1896, stating that he is entirely well. |
| 2 | O. L.<br>M.<br>21 | Well-developed young man; lost one brother of brain tuberculosis. Father is a trained nurse; boy received a blow on head a couple of years ago. Nov. 29, 1895, he noticed slight twitchings in right thumb, which were followed by a typical epileptic spell. Same day had two additional attacks of same character. The day following several such spells; in some of them the entire hand was convulsed. Well after that until April, 1895; then repeated epileptiform seizures involving the thumb, without loss of consciousness. Has received large doses of bromides (patient of Dr. Collins). | 2 yrs.(?) | 5½ mos. | First operation May 14, 1895, trephining and chiselling of skull to expose the centre for the right hand and arm; area determined by electrical tests. Under ether patient did so poorly that operation had to be abandoned at this point<br>May 20, 1895, second operation; dura opened; excision of the lower half of arm-centre; dura closed; trephine-opening about 3½ cm. in diameter; bone was not replaced. | On May 16th, after the first operation, had three convulsive seizures involving right half of the face and the right arm, with loss of consciousness.<br>On the day after second operation had a slight attack involving eye, right half of nose, and right eyelid; this attack was almost continuous for one hour, but no loss of consciousness; relieved by hypodermic injections of morphia; patient presented anæsthesia of right thumb and of index-finger, and a mild paresis of entire hand. May 26th, paresis had become distinctly | No attacks since May 21, 1895. Received at first 30 gr. of bromide daily. Bromide treatment was continued by Dr. Collins, but is now being gradually lessened. Dysarthria has disappeared entirely. There is no paresis of the right hand. Patient complains slightly of a feeling of formication in the thumb, but there is no anæsthesia. Is actively engaged in business, and is as bright as ever. This case will be described in full by Dr. Collins. Microscopic examination of the excised portions of the cortex by Dr. Wiener revealed an old focus of traumatic origin in the gray substance of the cortex, and the |

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| | | | | | | less; on May 31st paralysis was vastly improved; first walk June 12th, 21 days after second operation, was dismissed from hospital At that time exhibited slight dysarthria, which continued during the first two months. | remains of an old lepto-meningo-encephalitis. On inquiry, Dr. Collins reports that patient has had no attacks up to Sept. 1896. |
| 3 | J. B.<br>M.<br>8 | At the age of 7 months some traumatic injury. Feb 1891, epileptic attacks with sensory auræ (either the sound of an engine or a foul odor). For some time has had otitis media. If ear ceased discharging, had several attacks each day. Left mastoid process very painful. | At least 7 years; doubtful whether traumatic injury is the cause of the ear trouble. Several years have elapsed since the beginning of otitis. | 6 months. | First operation Aug. 14, 1891; left mastoid process opened up, two pieces of bone removed<br>Second operation Nov. 17, 1891; mastoid process opened again; silver canula introduced to secure permanent drainage. | Paralysis of left facial; on Sept. 10 first attack. After that repeated attacks as before operation.<br>The day after the operation convulsions of right half of body; since that time no attacks. | The mother states, April, 1895, 3½ years after the second operation, that the boy has had no attacks since—is absolutely well. |

## GROUP II.—CASES IMPROVED, BUT NOT CURED BY OPERATION.

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| 4 | T. C.<br>M.<br>44 | At the age of 11½ yrs. was severely kicked by a man on the right side of occiput; 6 months later first epileptic attacks, which were repeated; at first petit mal, later on grand mal. In first year 2 to 3 attacks, then at least one every 6 wks., but always during the night. No paralysis; no hemianopsia; distinct depression in occipital region. While patient was under observation was entirely free from attacks for a period of 8 weeks; attacks then returned. | 14½ yrs. | 14 years. | First operation May 29, 1891. Trephining and chiselling over depressed portion in right occipital region. Opening made about 3 cm. in diameter Enormous exostosis of skull, almost doubling underlying brain. | On November 22d, short spells, but no others for a period of 3 weeks, while in hospital. Went West and reported at first that attacks recurred about every six weeks, but after two years sent a letter stating that attacks were lighter and occurred only at intervals of three months. | Attacks have returned, but they are stated to be mild and somewhat rarer. Memory is normal. Is able to do work. Patient is of the opinion that he is very much better than before the operation. Last account received in autumn of 1893. |
| 5 | E. S.<br>M.<br>12 | In the spring of 1890 was run over by a wagon, and sustained severe injury over occipital region; unconscious for 10 days and had convulsions during this time. For a period of one year no convulsions, then seizures became frequent and regular, as many as 1 to 6 per day. Painful scar in left occipital region near the median line. No depression could be felt. | 2 years. | About 1 year. | First operation May 27th; trephining and chiselling over occipital region, an opening made about 3 cm. in diameter. Bone was not replaced. | Patient recovered rapidly; in the first year only one attack coming on after severe emotional excitement. For two years no seizures. During the intense heat of April, 1896, after a hard day's work in the garret of a factory, had a slight spell. Another slight spell in July, 1896. | Decided improvement; only three spells in four years. Complete recovery still possible. Boy is able to earn his own living. (We are indebted for this report to Dr. Stieglitz, who brought the patient to us.) |

| No. | Name, sex, and age. | Abstract of history. | Interval between trauma or beginning of disease and operation. | Interval between beginning of epilepsy and operation. | Date and character of operation. | Course after operation. | Remarks. |
|---|---|---|---|---|---|---|---|
| 6 | K. A.<br>M.<br>9 | At the age of 5 years had a "congestive chill" and spasms. No paralysis. Two or three years later developed Jacksonian epilepsy, beginning in the left hand, without loss of consciousness. No evidence of palsy. Boy feels left hand drawn up during the spell. | 4 years. | 1 to 2 yrs. | Operation April 12, 1892; trephining and excision of hand-centre in right hemisphere. | Hand was paretic for a few days only. Rapid recovery during six weeks in the hospital, no attacks; but as soon as he left hospital and ran about during hot weather had a severe attack with loss of consciousness and involuntary passage of urine. A number of such seizures during the next three months. | Improvement at first after operation, but recurrence of the attacks in consequence of insufficient care. In the later attacks right arm was also involved. |
| 7 | J. C.<br>M.<br>25 | A printer, strong drinker and smoker. 5 years previous to operation a severe epileptic seizure; in the spring of 1891 an injury to skull, probably during state of intoxication. This was followed by epileptic attacks which became more and more frequent. Since March, 1893, one seizure every two weeks. The convulsions begin in right hand followed by loss of consciousness. Large scar in right frontal region. | At least 2 years and 9 months. 1 epileptic seizure 5 years previously. | About 2½ years. | Operation Dec. 12, 1893; trephining over the arm-centre in the left hemisphere. Inner table adherent to dura At this point dura aspirated, no fluid withdrawn. Brain pulsates equally. A second trephine-opening was made in the frontal region over the scar Inner table separated from rest of skull; no fluid withdrawn by aspiration. | Recovered satisfactorily; but slight paresis of the right upper extremities and of the right facial, also distinct dysarthria. All these symptoms disappeared in the course of a month. Jan. 12, 1894, a mild attack, but no others until Feb. 8, 1894, when patient was dismissed from the hospital; since that time no report. | Improvement after operation more than was to be expected in the case of a man addicted to alcohol. Later report not obtainable; for that reason it is impossible to say whether improvement has continued. |
| 8 | L. C.<br>M.<br>6 | Said to have had brain fever at age of 10 months. At 5½ years first right-sided convulsions reported at intervals of one week. Right hemiparesis since first attack, athetoid and associated movements. | 5 years, but doubtful whether the cerebral disease at the age of 10 months was the direct cause. | 6 months. | Operation Dec. 29, 1890, exposure by chiselling of motor area of right arm, determined by faradization. Dura adherent and tense. No cyst found on puncture. | Recovery excellent; no convulsions up to Feb. 2, 1891, when boy was discharged from hospital. One attack since leaving hospital. | In the spring of 1896 we were able to obtain further information regarding this boy. He is now in an institution for feeble-minded children in Vineland, N. J. Dr. Corson reports that he has had a number of attacks from February to May, 1891, but that for a period of four years, until Aug 1895, he had not a single attack. Since that time occasional seizures have occurred. The athetosis still exists, but the hemiparesis is very slight. We may therefore state that there was a complete remission lasting four years. The probability of a cyst very great. Another operation indicated. |

## GROUP III.—CASES UNIMPROVED BY OPERATION.

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|---|---|---|---|---|---|---|---|
| 9 | W.C.H.<br>M.<br>20 | At the age of 12 years was pushed back over pole of wagon, supposed to have struck back of head(?). Unconscious for a few minutes, but continued work as usual; one week later general epileptic convulsions. Has petit mal, and above all Jacksonian epilepsy involving muscles around right half of mouth. Occasionally eyes are involved. Attacks very frequent, but as a rule no loss of consciousness in them. | 8 years. | 8 years. | Operation Feb. 13, 1891. Exposed centre representing right angle of mouth according to Horsley, determined by electrical stimulation. No excision. Adhesions under the button of bone; small cysts on dura. On puncture a little bloody fluid withdrawn; large opening (4 cm.); bone not replaced. | The recovery rapid after operation, but no diminution of attacks. | No improvement. We hesitated at the time to perform excision. In all probability this would have done little good. |
| 10 | M. K.<br>M.<br>16 | At age of 18 months fell out of window, since that time epileptic attacks at varying intervals. Has had enormous doses of bromides given him by a number of physicians. Is ill-tempered and stupid. Bromides were stopped. No attack for three weeks, then left-sided convulsions becoming general. | 14½ yrs. | 14 years | Operation Feb. 23, 1891. Large trephine-opening over motor area for arm and leg in right hemisphere. | Good recovery, but no diminution in the number of attacks. | Old case. Operation done at the bidding of father. |
| 11 | E. L.<br>M.<br>30 | Traumatic injury of right occipital region. General convulsions. | All data uncertain. | | Operation July 24, 1892, trephining over right occipital depression; adhesions between dura and skull. No excision. | Made good recovery, but developed delusions of persecution. Attacks returned after two weeks. | No improvement. Alcoholic case. |
| 12 | H L.<br>M.<br>24 | Six years previously fell, striking right(?) occiput. One yr. later first seizure affecting right arm and leg. As many as 6 attacks per day, at present only 3 or 4 in two weeks. | 6 years. | 5 years. | Operation Jan. 29, 1892, trephining over arm-centre, left hemisphere. Dura opened. Second operation March 8, 1892, excision of the entire arm-centre (electrical test). | Repeated attacks after both operations. | No improvement in spite of excision; slight paresis of the right arm coming on 2 days after excision. Paresis recovered from in the course of 2 weeks. |
| 13 | C. D.<br>F.<br>9 | Fell out of window at six months, striking head against bare floor. At 10 months a tedious illness, slow in development. At age of 5 years began to have innumerable convulsions (at least 50 per day); idiocy. | 8½ yrs. | 4 years, possibly longer. | Operation Feb. 15, 1892, large trephine-opening over the arm-centre of left hemisphere. | Rapid recovery. Attacks somewhat less. | No improvement. Operation done at the request of parents. |
| 14 | K. F.<br>F.<br>20 | Since the age of 13 months epileptic convulsions generally beginning in the right hand, then involving the right arm and right leg. History otherwise very uncertain. Three years ago patient was operated upon by another surgeon, who trephined over the right half of the skull. | 19 years. | 19 years. | Operation Jan. 30, 1894. The entire arm-centre in the left hemisphere was exposed by trephining, a number of punctures were made, but no cyst found. Dura opened; cortex appeared to be normal. Excision was not done because probability of recovery seemed altogether too slight. | Recovered rapidly; after two weeks, attacks were fully as frequent as before. | Patient is still under observation. There is no improvement whatever, although there has been a trephining operation done over both arm-centres. |

| No. | Name, sex, and age. | Abstract of history. | Interval between trauma or beginning of disease and operation. | Interval between beginning of epilepsy and operation. | Date and character of operation. | Course after operation. | Remarks. |
|---|---|---|---|---|---|---|---|
| 15 | H. P.<br>M.<br>17 | First examination Jan. 15, 1893. At some time in early childhood patient was struck on the head by an iron instrument in the hands of a stepmother. No spasms during dentition. No hereditary tendency to epilepsy. First attack at the age of 11 years; had general epileptic convulsions at that time. On examining the right parietal frontal region it was found to be painful on percussion; patient also refers to this region as the site of intense headaches. The father stated that the convulsions often begin in the left hand, but such seizures could not be observed in the hospital. | At least 10 years. | 6 years. | First operation Feb. 14, 1893. Trephining over arm-centre in left hemisphere.<br>Mar. 22, 1893, a second operation. Trephining over the arm-centre in the right hemisphere. No excision. | Recovery from operation prompt. A few attacks in the second to fourth weeks.<br>For two months after the second operation no attacks, but from that time on the same returned and have been quite as frequent as before; the headaches, however, were not so severe. | No improvement in epilepsy, but father and son insisted upon a third operation Attempt made to lessen tension caused by dense scar at site of first operation on left side. Third operation March 16, 1896. Cutting through scar at site of first operation, the surgeon found an enormously thickened membrane between dura and scalp. In attempting to separate adhesions and cutting through thickened membrane, excessive hemorrhage occurred which it was impossible to check for some time. Patient did not recover from shock of operation, and died in a condition of collapse three days after operation. |
| 16 | A. S.<br>M.<br>14 | At age of one year had an epileptic seizure following diphtheritic laryngitis. Subsequently left hemiplegia. Three years later left-sided convulsions, at first once a week, gradually becoming more frequent. For at least a year before operation, epileptic spells daily. Examination showed left hemiparesis. Had learned to talk with difficulty, beginning to utter a few words at age of 2 years. Imbecile. | 13 years. | 10 years. | Operation: Trephining over arm-centre in right hemisphere, excision of entire centre. Microscopical examination revealed an old hemorrhagic meningo-encephalitis. (See Fig. 145, Sachs, Nervous Diseases of Children.) | Recovered rapidly, but no distinct improvement after the operation. Only during first three days were attacks inhibited; on second day after operation left arm and left hand appeared more palsied; after three weeks arm and hand were in about same condition as before operation. | No improvement, but it may be noted that the palsy was not made permanently worse by the excision of tissue. According to report received several months after the operation no improvement whatever was noticeable |
| 17 | T. D.<br>M.<br>16 | Right hemiplegia since early childhood. At the age of 3 years the first epileptic seizures, which gradually became more intense and more frequent. | 14 yrs. (?) | 13 years. | Operation March 21, 1893. Bone flap formed over motor centre in left hemisphere. No pulsation of dura. After opening, dura was punctured revealing presence of a large cyst, size of which could not then be suspected, but it evidently had undermined almost entire hemisphere. Electrical stimulation of motor centres gave satisfactory responses. Gradual drainage of cyst. | Patient made a poor recovery. Serous fluid kept oozing away continuously. The patient went by degrees into a condition of coma and died May 9, 1893. | The size of the cyst could not be suspected; in such a case permanent drainage should of course not be attempted; trephining alone must suffice. |

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| 18 | B. J. B.<br>M.<br>34 | Letter-carrier. In Dec. 1888, was thrown from a wagon striking occiput; was unconscious for 15 minutes. After the fall felt fairly well with the exception of severe headaches now and then. Five months after the accident first epileptic seizure during sleep; seizures were nocturnal, for a long time once a week. In the year preceding operation has had two or three attacks per week at different times of day. No hemianopsia; no sensory auræ. Painful scar over the right occipital region. | 4½ yrs. | 4 years. | Operation July 18, 1893. A large flap was formed in right parieto-occipital region, including the old scar. No external depression of skull; trephining; dura thickened and very hyperæmic. Puncture negative. No excision. Dura not opened. | Had no attacks up to July 30. In the absence of surgeon further treatment was left in the hands of an assistant, who appears to have been careless in changing dressings. All the symptoms of a septic meningitis appeared, with high temperature and coma Died Aug. 3, 1893. | Greater care in the after-treatment of this case would have prevented the sad outcome. The operation itself was in nowise to blame for the death. |
| 19 | F. L.<br>M.<br>15 | Until the age of three years was mentally and physically sound. When about 3½ years fell from a chair striking the back of head(?). At the age of 4½ years had first attack of petit mal, soon thereafter a distinct attack with convulsions; the head always turned to the right, the right hand and the right leg being convulsed first, and then the convulsions would become general; loss of consciousness in nearly every attack. The seizures have become more frequent, often 4 or 5 a day. In the hospital a number of seizures were observed, but they bore the character of general convulsions. Patient is feeble-minded. | 12 years. | 11 years. | First operation Feb. 11, 1896. Bone-flap formed over arm-centre in the left hemisphere, excision of the centre.<br>Second operation May 13, 1896, similar to first operation, but excision of the arm-centre in right hemisphere.<br>In both operations the motor areas were determined electrically; the bone was replaced. | Patient recovered rapidly, but attacks returned 12 hours after operation in spite of large doses of bromide and chloral. He had two or three general convulsions daily. Recovery rapid; no diminution in attacks. | Patient was operated upon at request of parents. It is evident that excision of both motor arm-centres was of no avail. It is interesting to observe that in this case after each operation the extremity corresponding to excised centre was only slightly paretic for 48 hours; after that patient was as well able to move these parts as before. Sensory tests could not be made satisfactorily on account of mental condition of patient. April 20, 1896, he was dismissed from hospital as "unimproved." Examination of excised piece of cortex revealed degeneration of the pyramidal cells and thickening of neuroglia. A full report is to be made by Dr. Wiener. |

If we compare the various groups of cases, we are struck at once by the fact that among the cases which have been cured there are two in which only a relatively short time had elapsed between the traumatic injury and the operation. Furthermore, that in one case only six months had passed between the beginning of the epilepsy and the preceding traumatic injury to the skull. In the other, a period of about two years.[1] In Case 3 it is a little doubtful whether the traumatic injury can be held responsible for the development of the epilepsy. We incline rather to the view that the ear trouble was developed independently of the preceding trauma. In the second group we note that a more considerable period of time had elapsed between the injury or the beginning of the disease and the operation. In those cases of this group in which the period of time was a relatively short one, and yet complete recovery did not set in, the failure can be attributed to other causes. In Case 5 the improvement was very remarkable, for only three attacks had occurred in four years; but the boy is compelled to do hard work, and it is fair to predict that if he had been able to take better care of himself he would have recovered completely. The same is true of Case 6, while in Case 7 the abuse of alcohol is to be considered the chief reason for the poor result obtained. The importance of careful treatment for a long time after an operation is well demonstrated in Case 8. In all of the cases in Group III. the operation was not undertaken until many years had passed after the initial trauma and after the beginning of the epilepsy. We may infer from this that the prospect of curing epilepsy is a gloomy one if many years have elapsed since the disease has manifested itself; and if a long period of time has elapsed, it matters little whether we resort to trephining or excision, for all operative procedures will prove equally unavailing.

Returning to the consideration of Case I., we may note that it was sufficient to remove the depressed portions of bone and to expose a considerable area around the old scar to effect a cure of the epilepsy. The result in this case is all the more remarkable because the patient had revealed a distinct tendency to alternating conditions of consciousness—a condition which we know to be common in genuine epilepsy. Such predisposition would unquestionably make the prognosis less favorable in the majority of cases, and yet the good results obtained in this instance prove that even under such circumstances one need not desist from operative procedures if the patient's general constitution and the character of the skull-injury warrant surgical interference. This same patient—a man of great intelligence—sent a letter only a few months ago in which he stated that he considered himself completely cured by the operation. In the second case, for which we are indebted to Dr. Collins, the wisdom of early surgical interference is very apparent, for the microscopical examination of the excised portion of the cortex has shown that the disease was due to a well-circumscribed focus of traumatic origin, which would surely in the course of time have given rise to a widespread degeneration of the association-fibres, as Muratow has lately explained. Case 3 proves that any irritating condition, such as an otitis media, may give rise to chronic epilepsy. In this instance two operations were needed to bring about a satisfactory result. In a previous article we have spoken of the result in this case in a rather reserved fashion, for six months only had passed since the operation and the time of the first report; but the mother of this boy has made further reports, and we can now claim that the boy has been cured, for the mother reported, three and a half years after the operation, that the boy had not had a single attack. It will not be necessary to discuss in detail each one of the cases reported in Groups II. and III. The reader is referred to the tables, which have been carefully prepared, and we trust that he will find it worth his while to note the points of resemblance between the more or less successful and the totally unsuccessful cases. If we were to attempt to give a purely statistical statement, we might say that *of the nineteen cases here reported three were cured, two greatly improved, three somewhat improved; while in eleven cases there was absolutely no improvement.* These last eleven cases are equally valuable, however, in showing that partial epilepsies which have existed for a long number of years cannot be cured or improved by any operative procedure.

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[1] The importance of the time-element in these cases does not seem to have been appreciated by the latest authors on this subject---Broca and Maubrac.

If we attempt to decide which surgical procedure would seem to be best adapted to effect a cure of partial epilepsies, the answer is that no one method would seem to be superior to all the others. If there is depression of the skull or any other traumatic injury of the same, trephining alone will, as a matter of course, prove beneficial. If there is a thickening of the membranes and adhesions, as is so frequently the case in the wake of traumatic injuries, the removal of such diseased tissue is in order. If there is any morbid process, such as in our Case 3, which is the main cause of the epilepsy, the attempt should be made to cure the primary disease in the usual way. If the symptoms point to a strictly localized focus of disease in the cortex, whether or not there be a complicating injury to the skull, it is advisable to excise the diseased area, particularly if a relatively short period of time has elapsed since the injury was inflicted. The result in Case 2 is the strongest argument in favor of this procedure.

A number of years ago we had referred to this as the only rational method in the surgical treatment of epilepsy, and this opinion has been strengthened by our own experiences and by a few of the cases recorded in literature. A satisfactory result has been obtained in this way by Horsley (*British Medical Journal*, August, 1886, p. 674) in several cases, and in at least one case the attacks have not returned for a period of one year. Several other reports of Horsley are open to the serious objection that the report was made altogether too early after the operation. The same criticism is to be made upon the case recorded by Beach (*Boston Medical and Surgical Journal*, April 3, 1890). An improvement, though not a complete cure, was obtained by the method of excision in the case of Bergmann (*Die Chirurgische Behandlung der Hirnkrankheiten*, etc., second edition, p. 169, Berlin, 1889), in the case of Parker and Gotch (*British Medical Journal*, London, May 27, 1893), and in a case of Bidwell and Sherrington (*British Medical Journal*, November 4, 1893). In all of these cases, and in some of our own in which merely an improvement was noted, the lapse of time between the initial injury or beginning of disease and the time of the operation is altogether too great. The only exception to this is in the case of Parker and Gotch; but here it is a little doubtful whether the correct centre was excised. For the purpose of giving this method a fair test we have performed excision of cortical tissue upon a number of different patients (Cases 2, 6, 12, 16, and 19). Our experience in these cases leads to the conclusion that in epilepsy of long standing the excision of cortical tissue does no good; and such excision is hereafter to be restricted to epilepsies of short duration. In our first article on this subject we were inclined to take a less favorable view of this method; but at that time we had not yet perceived the importance of recognizing the length of time the epilepsy had lasted.

The neurologist is asked to decide whether the site for the operation shall be determined according to the seat of the external injury or whether it shall be determined entirely by the clinical symptoms if both do not happen to coincide with each other. In answering this question we would urge that the clinical symptoms are far more reliable than any external injury. If the two areas are distinct, it may be well in some instances to trephine over both; but excision should only be performed in that part of the cortex to which the symptoms point, unless the cortical tissue underneath the seat of external injury is clearly diseased.

The greatest care is also necessary in determining the region which the clinical symptoms indicate to be the diseased area. The ordinary methods of determining these areas that have been devised by Reid Thane, Hammond, and others, are satisfactory enough; but it is essential, whenever possible, to determine the function of the exposed part by electrical stimulation, and this can be done readily, as we have shown, before the dura is opened. If the site has been properly located, electrical stimulation of the exposed tissue will cause contraction of the part first convulsed in the epileptic seizures with which the patient is afflicted. Occasionally it will be possible to produce a slight convulsive seizure during the operation; but this cannot be produced in every instance unless excessively high currents are employed. In Case 9 the accuracy of such determination was brought out most distinctly.

A further duty devolving more particularly upon the surgeon is to determine the means by which the formation of tense scars may be avoided. In Case 15 we discovered at the time of the third operation, which was undertaken fully two and a half years after the first one, that the trephine-opening was filled by a mass of dense tissue which had surely increased the local pressure, and had thus undone any good effect that might have been expected from the removal of a large button of bone. Such dense tissue is possibly worse than slight adhesions and a moderately depressed spicule of bone. The scar appears to become more tense in those cases in which the bone is not replaced, and in several patients of ours we have observed years after the trephine-opening had been made that the pulsations in the brain could not be noticed or felt. The only method known to us at the present time to avoid the formation of these scars is the introduction of some pliable metal plate between the dura and the skull. Gerster made use of this method in an operation done upon a patient of Stieglitz for the removal of a cerebral cyst. Two years and nine months after the first operation upon this patient a second operation became necessary, and at this second operation it was made evident that the gold plate lay exactly as it was introduced—that the surrounding tissue had undergone fewer changes than would have been the case if the ordinary scar had formed. If these operations for epilepsy are to be successful, a serious attempt must be made to avoid the formation of dense scar-tissue; and it is possible that the heteroplastic closure of the skull-opening will contribute somewhat to the avoidance of excessive scar-formation. At all events, the evils attendant upon the development of scar-tissue must be mitigated in some way or other, and it will not do to regard it as an unavoidable complication in all cerebral operations, as is done by Starr.[1]

Before concluding this report a few remarks will be in order regarding the cases of epilepsy associated with infantile cerebral palsies. In various previous writings one of us (Sachs) had called attention to the fact that such palsies are amenable to surgical treatment for the very reason that cystic conditions or old hemorrhagic foci often constitute the anatomical substratum both of the epilepsy and of the palsy. Cases 6, 8, 16, 17, and possibly Case 14 belong to this category. In none of these have we achieved an absolute cure, yet the improvement in Case 8 has been most decided. The failure to obtain a cure in these cases is explained easily enough. Above all, it is true that these cases in particular are not brought to the notice of neurologists until years have elapsed after the beginning of disease; but even if they came under observation at a much earlier period, we should have some hesitation in advising operation, for we know that children under the age of six years tolerate poorly almost every form of cerebral or cranial operation. The sad result in Case 17 suggests the possibility of finding in these infantile cases cysts of enormous size, possibly underlying the entire hemispheres. The drainage of such cysts is a very delicate matter, and yet the experience of Kocher and others in the treatment of large cysts would lead us to believe that by the exercise of the greatest care some of these patients may be vastly improved, if not absolutely cured. All of these difficulties can be met, and we confidently believe that cases will occur in which the removal of a well-limited focus of disease will prove beneficial. Physicians and patients should be imbued with the idea that, other things being equal, the earlier operative interference is attempted, the more successful it is bound to be. The excision of diseased cortical tissue or the drainage, if not the removal of an old cyst, will cause comparatively little additional disturbance of function, for the parts governed by the diseased centres are, as a rule, considerably palsied. The epilepsy may be improved, the palsy can hardly be made worse by the operation.[1]

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[1] Brain Surgery, p. 112.

From the preceding discussion we may draw the following conclusions:

1. Surgical interference is advisable in those cases of partial epilepsy in which not more than one, or at the utmost two years, have elapsed since the traumatic injury or the beginning of the disease which has given rise to the convulsive seizures.

2. In cases of depression or other injury of the skull surgical interference is warranted even though a number of years have elapsed; but the prospect of recovery is brighter the shorter the period of time since the injury.

3. Simple trephining may prove sufficient in a number of cases, and

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[1] Operations for the removal or cure of epilepsy associated with infantile cerebral palsies have been done by Oppenheim and Sonnenburg (Berlin. klinisch. Woch., 1892, p. 60), by Bullard (Boston Medical Journal, February, 1888), by Keen (THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES, September, 1891), by Wildermuth (Neurolog. Centralbl., 1891, p. 935), by Wyeth (two cases with Sachs), Horsley (British Medical Journal, 1890, vol. iii. p. 1291), and others. It may be well to add that in some of these infantile cerebral palsies with epilepsy there is a marked atrophy of part of the cerebral hemispheres. The excision of atrophic tissue or of a porencephalic area, as has been practised by some, is not rational.

particularly in those in which there is an injury to the skull or in which a cystic condition is the main cause of the epilepsy.

4. Excision of cortical tissue is advisable if the epilepsy has lasted but a short time, and if the symptoms point to a strictly circumscribed focus of disease.

5. Since such cortical lesions are often of a microscopical character, excision should be practised even if the tissue appears to be perfectly normal at the time of operation; but the greatest caution should be exercised in order to make sure that the proper area is removed.

6. Surgical interference for the cure of epilepsy associated with infantile cerebral palsies may be attempted, particularly if too long an interval has not elapsed since the beginning of the palsy.

7. In cases of epilepsy of long standing, in which there is in all probability a widespread degeneration of the association-fibres, every surgical procedure is useless.

# SOME ABNORMALITIES OF THE FEMALE GENERATIVE ORGANS.

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It is most important that abnormalities occurring in the human subject should be recorded and their relation to developmental anatomy studied. This is especially true of the many interesting examples of so-called malformation affecting the female genitalia. By this means additional links may be added to the complex chain of development. To make this subject sufficiently clear it will be necessary to describe the steps in the formation of the internal and external organs of generation. Cases observed personally will be added and their relation to fœtal anatomy detailed.

Those who have studied this subject must have noticed that a so-called malformation is, in reality, a non-formation of one part involving a relative disproportion. Malformations represent stages of development which have remained permanent. Before an organ has reached the mature, or, as we term it, the fully developed state, we are enabled to distinguish two processes at work, viz., development and growth. The period of development in the uterus extends up to the time of puberty, the period of growth is much longer, probably lasting until the twentieth year.

In the human female the vagina, uterus, and Fallopian tubes are formed out of the Müllerian ducts. The portions of those ducts which become fused are developed into the vagina, cervix, and part of the body of the uterus. The next following portions of the Müllerian ducts constitute in animals with bicornuate uteri the horns of the uterus. In the human female these portions of the ducts remain comparatively short, entering into the formation of the upper part of the uterus. The remaining upper portions of the ducts of Müller form the Fallopian tubes.

The presence of a two-horned uterus, the normal condition in many animals, occurs in the human embryo of the third month. The subsequent median fusion and consolidation of these horns form the triangular body of the human uterus. Again, there is no distinction in the human fœtus at the third month between the vagina and the uterus, which is also seen in many animals. At a later period the os uteri begins to form, and gradually a distinct neck (cervix) can be seen. Thickening in the walls occurs first in the cervix, which up to the time of birth is much larger and thicker than the body of the uterus. It will be seen that there is a close relationship between fœtal anatomy, comparative anatomy, and abnormalities in the anatomy of the female genitalia.

External Generative Organs. There is no distinction of sex in the human embryo up to a certain period of development. In both sexes the structures distinguishing the male and the female externally arise respectively from common masses of blastema of precisely similar structure and connections.

The common cloaca exists till after the fifth week, and the genital eminence from which the clitoris is formed makes its appearance in the course of the fifth and sixth weeks in front of and within the common orifice. A week or two later the common orifice becomes divided, the precise method of division not being definitely ascertained. The cloaca is thus separated into a dorsal or anal and a ventral or uro-genital part. A transverse band of integument appearing at the ninth or tenth week completes the division between the anal and urogenital orifices, forming the so-called perineum in the female. The urogenital portion contracts in its upper part to form the urethra, whilst the lower part persists as the vestibule. The labia minora are developed from the margins of the genital cleft.

This short outline will suffice to explain the main points in the development of the internal and external generative organs. We have now to study the bearing of developmental anatomy on certain abnormalities of the genitalia in the human female. For this purpose I shall narrate the cases which have come under my own observation and briefly refer to some of those already described in the literature on the subject.

Case I.—A. L., aged thirty-one years; married, sterile. Complaint: swelling in the left groin, "Ever since she can remember." Patient had a masculine appearance, hair on upper lip and chin, and hair extending from pubes upward along the linea alba to the umbilicus. Her voice was not of a masculine character. She was very nervous. The swelling in the groin was stated to enlarge and become more tender during the menstrual periods—which are regular. Pressure on this swelling caused a sickening pain.

*Examination of genitalia.* The breasts are badly developed. The external genitals showed nothing abnormal. The vagina proper ends in a cul-de-sac one and one-half inches long, with a small aperture, the os uteri, at the upper end. The recto-vaginal septum is incomplete at the lower end, and feces are passed through the vagina.

She has control over the bowel unless diarrhœa be present. No sphincter is appreciable to the finger. The anus proper is the size of a No. 6 catheter, and a probe passed through it can be felt by the finger introduced into the vagina.

The uterus, which measures about one and one quarter inches, may be felt bimanually.

An operation for the radical cure of the hernia was carried out by Mr. Keetley at the West London Hospital, to whom I am indebted for the following notes: When incised the sac contained the ovary, Fallopian tube, and a portion of the uterus. The sac was thin-walled and had no true neck. The operation was a complete success.

Case II.—A. W., aged twenty-one years. Complaint: amenorrhœa. She had no male characteristics. Since the age of fourteen years for two or three days every month has had headache, backache, and bearing-down pains. A swelling has appeared in the left inguinal region at intervals for " some time." She states that occasionally the pains are so severe that she becomes faint and is prevented from working. Her pains have increased since she sought medical advice. Removal of the ovaries had been advised by a former medical attendant. These pains have been worse since straining herself while drawing water five years ago.

*Examination of genitalia.* Complete absence of pubic hair; clitoris rudimentary. The vagina, about one inch in length, forms a cul de sac, at the upper end of which a small papilla is noted corresponding to the usual position of the os uteri. Bimanually (recto-abdominal)[1] no uterus, tubes, or ovaries can be felt. In the position of the uterus a broad band is found extending from one side of the pelvis to the other, midway between the bladder and the rectum.

The breasts were well developed and the nipples normal.

While an undergraduate at Edinburgh University I saw the following case, which is described in the *Edinburgh Medical Journal,* xxxii. 734.

M. M., aged twenty-one years. Had absence of left ninth rib and slight lateral dorsal curvature. When the patient coughed a large hernial protrusion was observed between the eighth and tenth ribs, especially posteriorly. Her complaint was absence of menstruation.

*Examination.* Mammæ well developed, with large nipples. Dense imperforate hymen. Entire absence of all uterine organs and vagina. Bladder and rectum normal. Pubic hair normally developed. This woman was well developed and had no apparent evidence of retarded development.

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[1] Such cases are best examined per rectum combined with a sound in the bladder.

In addition to these cases I have seen :

1. A case in which there was an orifice at the upper part of the vagina in the position of the os uteri admitting the tip of a sound. Here the uterus was represented by a cord-like structure occupying the centre of a broad band similar to that described in Case II.

2. Another case in which the uterine probe penetrated half an inch into a spindle-shaped body, the representative of the uterus.

Most authors describe cases of absence of the uterus as being very rare. I am inclined to think that such an abnormality is commoner than is supposed, in spite of the small number of published cases, especially in England. The following cases may be mentioned as bearing more particularly on the subject of absence of the uterus :

1. Leopold (*Archiv. f. Gyn.*, Band 8, p. 484). Patient was slender; habits and inclinations purely feminine. Mons veneris prominent, owing to a testicle and epididymis on either side, each with its vas deferens returning into the pelvis (!). (No post-mortem was obtained.) Normal vagina, no uterus or ovaries. Pelvis normal; roomy, broad outlet. (In this paper reference is made to three previous papers.)

2. Kahn (*Centralblatt f. Gyn.*, xi. 377). Patient aged twenty-one years. Breasts medium size, no axillary hair. No hair on mons veneris; a few hairs on labia majora. Clitoris, præputium, and urethra normal. Vagina 6 to 8 cm. long. Double hernia. No orifice at end of vagina.

3. Grechen (*Centralblatt f. Gyn.*, xi. p. 493). Patient aged twenty-seven years. Had since seventeen very severe hypogastric and sacral pains. Breasts and pelvis well developed. External genitals normal. Vagina 7 to 9 cm. long, ending blindly. Uterus absent. Ovaries said to be in a normal position. Removal of ovaries advised.

4. Mundé[1] (*Centralblatt f. Gyn.*, xi. p. 670). Patient aged forty-six years. Had never menstruated. She was well developed. Breasts well formed. External genitals normal. Clitoris not enlarged. Urethra normal. Double inguinal hernia. Hymen normal. Vagina 8 cm. long, normal dimensions, ending blindly; no trace of portio or external os. Had a rounded body in each labium majus, character not ascertained, supposed to be testicles.

5. Steinschneider (*Centralblatt f. Gyn.*, xii. 49). Patient aged twenty-eight years, married. Breasts not well developed. External genitals normal, clitoris small. Vagina 8 cm. long. No uterus or ovaries.

6. Zweifel (*Centralblatt f. Gyn.*, p. 474). Patient shown at the Leipzig Obstetrical Society. Aged twenty two years. No beard. Breasts well developed. A little hair on mons veneris. Absence of axillary hair. Double inguinal hernia. Vulva normal. Vagina 9 cm. long, ending blindly, no trace of portio. Careful examination showed the presence of a radiating cicatrix without any opening even to the finest sound. Bimanually, a body, like a hazelnut, was found in the position of the uterus, and two rudimentary uterine horns passing to normal ovaries.

Two other cases were shown :

*a*. Atresia of the vagina, with a rudimentary uterus.

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[1] This case is described in a paper by Swasey, American Journal of Obstetrics, vol. xiv. 1881, p. 94.

*b.* Absence of vagina; dilated urethra. At the top of the bladder a rudimentary uterus could be felt with tubes and ovaries. Double hernia.

7. Flothmann (*Archiv. f. Gyn.*, xxxiii. p. 312). Patient aged twenty-four years, married. Breasts well developed. Urethra widely dilated, allowing the passage of the finger. "Mässige Ausbuchtung" under the very wide urethra. Uterus spindle-shaped. No incontinence of urine, although the urethra was very wide.

8. Rheinstädter (*Archiv. f. Gyn.*, xiv. p. 497). *a.* Aged twenty-two years. Female habitus, female voice, well-developed breasts, pelvis female type. Absence of menstruation. Under anæsthesia the vagina, uterus, and ovaries found to be absent. The external genitals well formed. Bimanually, a body taken to be a rudimentary uterine horn was said to have been detected.

*b.* Aged twenty-seven years. Had male characteristics—hair on chin and lips, male voice. No breasts; triangular distribution of pubic hair. Clitoris 5 cm. long. Uterus and vagina form a single continuous muscular canal exhibiting annular folds of its mucous lining. With care the index-finger could be passed to the extremity of this canal. No ovaries or testicles could be discovered. The labia flabby; the nymphæ absent. The urethral opening is 1 cm. over the first folds of the utero-vaginal canal, which probably represents the hymen.

9. Rheinstädter (*Centralblatt f. Gyn.*, No. 23, p. 345). Absence of uterus; abnormally wide vagina. In addition there was a herniated ovarian tumor, described as an "angiosarcoma."

An interesting case of what is termed partial defect of the uterus is described and figured by Winckel in his *Lehrbuch der Frauen-Krankheiten*, p. 292 (Zweite Auflage). The uterus had no portio vaginalis and was supposed to commence from the point where the posterior columna of the vagina ended. The tubes, ovaries, and adnexa were absent. No adhesions were present in the neighborhood of the uterus. The specimen was obtained from a fœtus at about the eighth month.

In the *London Obstetrical Society Transactions*, vol. xxi. p. 256, will be found an important communication by Dr. Chambers, in which the previous literature of ovarian hernia is given and a case of great interest fully described. Patient aged twenty-four years. Voice feminine. Breasts well formed; nipples absent, their site being marked by a circular rose-colored spot the size of a threepenny piece. In each groin there was a swelling whose nature was accurately determined after operation. No hair on pubis. Mons veneris not conspicuous. Clitoris small, well formed. Nymphæ rudimentary; vagina smooth, cone-shaped, about one inch long, ending in a cul-de-sac. In the roof of this cul-de-sac there was a triangular opening-apex upward and forward, large enough to admit tip of index-finger. This opening was the meatus urinarius. There was no trace of os uteri, cervix, or uterus. Pelvis was large, well formed, and of the female type. A committee of the Society having examined the tumors removed, reported that microscopically they resembled fœtal testicles, although the stroma was in greater abundance. The great and permanent value of such a case lies in the fact that the swellings were removed and microscopically examined, for by this means alone can the nature of such cases be decided.

We have now to compare these abnormalities in the human female with the ascertained facts of development.

It must be recollected that no *definite opinion* as to the absence of the uterus, ovaries, etc., can be given unless a post-mortem examination has been made or an abdominal operation performed. At the same time opinions formed after careful bimanual examination furnish fairly conclusive proof of the presence or absence of the various pelvic organs.

OVARIES. In the foregoing cases the presence of ovaries has been noted even where the uterus was absent and vagina, etc., imperfectly formed. Such an occurrence should be expected from our developmental knowledge, as the ovaries have a distinct origin apart from the uterus and tubes. Most authorities are agreed that the ovaries arise from formative blastema, situated on the mesial side of the Wolffian body.

In males the testicles arise in a similar situation, so that in the early human embryo there is no sexual distinction in the internal generative organs until the seventh week, becoming more apparent in the eighth.

Cases have been brought forward to prove that the swellings found in the labia and inguinal regions in some cases of abnormal development of the sexual organs are testicles. Such a conclusion is difficult to substantiate even with the aid of microscopic examination. I am inclined to think that in some of these cases the structures found represent a stage of development in which the distinction between ovary and testicle is not marked.

Again, in the foregoing cases pains are noted as occurring at the menstrual periods. These pains are of varying degrees of severity, and in certain cases removal of the ovaries has been recommended. Careful inquiry into the previous history of such patients will show that in many these pains originated after seeking medical advice, when the medical attendant had incautiously informed the sufferer of her condition. The influence on the mind of a patient produced by the use of complex medical terms, especially those popularly believed to be of serious import, must never be forgotten in dealing with disease in the female sex, and the more so, if, as in some of the cases narrated, the patients belong to that class to which the term neurotic is applied. Cases requiring removal of the ovaries must be very rare, and I feel sure most will yield to general treatment.

UTERUS. A study of the examples described shows a gradual transition from complete absence of the uterus to the infantile form.

1. There are cases in which no uterus is present, the vagina being a cul-de-sac.

2. Cases in which at the blind end of the vagina a nodule is found occupying a central position; this nodule has no canal in its interior.

3. Cases in which the nodule previously mentioned forms the lower portion of a small central body admitting the point of a probe.

4. Cases in which the probe can be passed for a distance of one-half to

three-quarters of an inch into a body, cord-like or spindle-shaped, occupying a position corresponding to the normal uterus.

The last group forms a transitional stage preliminary to what is called the infantile uterus, which may persist throughout adult life, and is the normal condition in the female child at full term. Examples of infantile uterus are sufficiently common, so that a detailed description is unnecessary. The uterine body is short; the cervix, one and one-half inches long, is two or even three times the length of the body (one-half to three-quarters of an inch). The whole uterus is smaller than normal. The walls, especially of the body, are thin and the cavity small. It will be seen that where there is a total or partial absence of a uterus the vagina is abnormally short.

The first case narrated shows the defective formation of the recto-vaginal septum, the anus being in the normal position. As the exact manner of the formation of this septum is not definitely ascertained, all such cases of defective development should be recorded. The anus being developed as an ingrowth from the exterior explains the relation in this particular case.

External Genitalia. It is interesting to observe how frequently the external genitals are fully formed while there is total or partial absence of those situated internally. A certain number of cases exist in which there are one or more defects in structure. The pubic hair may be entirely absent, the clitoris rudimentary or unusually enlarged, or a dense imperforate barrier may be present in the position of the hymen. We have further to note the occasional presence of swellings in the labia, some stated to be testicles, others ovaries, although more commonly containing bowel. The frequent occurrence of herniæ in the cases described serves to illustrate what has been commented upon by several authors, viz., the association of deformities.

Condition of the Breasts. The breasts may be poorly developed or no alteration noticed, both the breast-tissue and the nipples being well formed.

General Development. Patients exhibiting abnormalities of the genital apparatus may be divided into three types: masculine, feminine, and infantile.

1. *The Masculine Type.* Here there is an approach to the characters distinctive of the male sex. A growth of hair on the upper lip, chin, and cheeks may exist. The voice is masculine. The breasts resemble those of the male sex; nevertheless well-developed mammary glands are frequently noted. Hair around the nipples is occasionally seen. The pubic hair is continued up the linea alba to the umbilicus, thus resembling the distribution in the male. The shoulders are broad, and the pelvis corresponds to the masculine type. These characters, although possessed by certain females whose genital organs are abnormally formed,

are also found where the genitalia are well formed. Many females of the masculine type (with well-formed genitals) bear children despite the popular belief to the contrary.

2. *The Feminine Type.* Under this head are included those cases in which in appearance and general development there is no departure from that of the human female excepting the abnormality of the genital organs.

3. *The Infantile Type.* The characters of this type resemble those of the infant, hence the name. There is frequently feeble general development, with smallness of stature. The breasts are poorly developed. The axillary hair is absent, also the hair covering the pubis. The pelvis is small.

Such a classification is convenient and sufficiently accurate for practical purposes.

In conclusion, let me again express the hope that all cases of abnormality of the female genitalia will be published and their relation to development studied.

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## CHRONIC TYMPANIC VERTIGO; ITS RELIEF BY SURGICAL REMOVAL OF THE INCUS.

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In January, 1892, I reported[1] ten cases of chronic catarrhal deafness, tinnitus aurium, and vertigo treated by excision of the membrana tympani and the two larger ossicles, with the following results:

| | | |
|---|---|---|
| Deafness relieved in | 4 cases out of | 10 |
| “ not relieved in | 6 “ “ | 10 |
| Tinnitus greatly relieved in | 3 “ “ | 10 |
| “ somewhat relieved in | 5 “ “ | 10 |
| “ not relieved in | 2 “ “ | 10 |
| Vertigo not present in | 3 “ “ | 10 |
| “ greatly relieved in | 5 “ “ | 10 |
| “ slightly relieved in | 2 “ “ | 10 |

The greatest average of success of this treatment is seen in the relief of the vertigo; the lowest in the deafness. It is thus shown that chronic tympanic vertigo can be relieved by total excision of the membrana and the malleus, the incus being allowed to remain in position; but as this operation is invariably followed by more or less inflammatory reaction, I have abandoned it for simple incision in the membrana and removal of the incus, which liberates the stapes most completely and is never followed by reaction of any moment.

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[1] International Clinics.

I now present notes of sixteen additional, unselected, consecutive cases of chronic catarrhal deafness, tinnitus, and tympanic vertigo (so-called Ménière's disease) in which the vertigo was the prominent and annoying symptom and chiefly for relief of which the operations were performed. Most of these cases before seen by me had been treated with internal remedies for "neurasthenia," "biliousness," etc., but without any relief, the lesion in the ear not having been recognized as the cause of the vertigo. In nearly all of them, Cases XI. and XXVI. excepted, my operation for relief consisted in removal of the incus only. This liberated the stapes, the inward pressure of which, by the retraction of the membrana, malleus, and incus, I believe to be the prime cause of tympanic vertigo.

Tympanic vertigo is a term I suggested some time ago for that form of ear-vertigo produced by chronic catarrhal otitis media. It is characterized by paroxysms of increased tinnitus, vertigo, and nausea, with, at times, reeling, falling, and vomiting, but no loss of consciousness. To this vertigo the name of Ménière's disease has been frequently very erroneously applied. The term Ménière's disease is now limited in its application by aurists to disease of the internal ear, a rare malady, however.

In every case of so-called chronic catarrh of the middle ear there is a tendency to thickening, contraction, and stiffening of the mucous membrane lining the drum-cavity and covering its contents. This tends to retraction of the membrana tympani and the ossicula through contraction of the tensor tympani muscle, with consequent impaction of the stapes in the oval window. The membrane of the round window, which normally furnishes a yielding point to the inward pressure of the stapes upon the labyrinth-fluid, being thickened and stiffened by the chronic catarrhal process in the tympanic cavity, fails to yield to the retraction of the stapes, the labyrinth-space is thus compromised, the labyrinth-fluid and the motor filaments of the auditory nerve compressed, the cerebellum reflexively irritated, and motor disturbances in equilibrium of a vertiginous form are paroxysmally excited.

The paroxysmal nature of the tympanic vertigo is due to the fact that the above-described retraction and impaction of the larger ossicula with the stapes vary with the catarrhal state of the nasopharynx, the general health of the patient, and the condition of the atmosphere.

The physical causes of the attacks of vertigo being as above described, it seems rational to suppose that if this retractive power over the stapes could be permanently overcome the vertiginous paroxysms would be permanently checked. This can be effected best and most safely, as already stated, by surgical removal of the incus only.

The following cases demonstrate that chronic tympanic vertigo is produced as described, because it is relievable by the removal of the incus and consequent liberation of the stapes.

CASE XI.[1] *Deafness, tinnitus, vertigo; cicatrized purulent otitis media; excision of the membrana tympani and remnant of the malleus; no relief from any of the symptoms.*—August 17, 1892. T. N., aged fifty-three years, a carpenter. The patient states that last winter he had a fall, striking his head. In April following he had a severe cold, with running from his right ear. The ear stopped running in June, since which time, about three months, he has suffered from constant tinnitus in that ear, with dizziness at times, which he attributes to the condition of the ear. He inclines markedly toward the well side when dizzy, and more or less so all the time in walking. He has nearly fallen at times, but never entirely, and he has never lost consciousness in any of the attacks of vertigo. He has been unable to do any work since his fall, six months previous to the above date.

The hearing for the voice in the right ear was very much reduced; but the tuning-fork was heard through the air about one inch, and well through the bones of the head. Examination revealed a large cicatrized perforation in the posterior upper quarter of the drum-membrane. The cicatrix moved under Siegle's pneumatic speculum, but the rest of the membrana was immovable, the handle of the malleus being partly destroyed. The left ear presented symptoms of catarrhal otitis media, with profound deafness, but no tinnitus.

On August 25th, the patient under ether, the membrana and remnant of the malleus were removed by excision. The incus was neither seen nor felt.

There was no change in this man's condition from the operation; he still inclined toward the left side in walking. By September 10th there was a slightly painful reaction for a few days, followed by some discharge from the ear. He was seen as late as March 14, 1893, when it was found that there was no regeneration of the membrana. He still inclined toward the left side in walking, and upon the whole I could see no improvement from the operation. Probably there had been a central lesion from the fall mentioned above.

This was the last instance in which I performed total excision of the membrana tympani for the relief of symptoms of chronic catarrh of the middle-ear. Abandonment of this operation is due to the fact that it is followed sooner or later by more or less severe reaction in the drum-cavity and regeneration of the membrana. It is true that I have relieved vertigo and tinnitus by such an operation, but as the same relief can be given by the simple and harmless removal of the incus I have resorted to this operation for the past three years.

CASE XII. *Deafness, tinnitus, and vertigo; chronic catarrhal otitis media in the left ear; removal of the incus; tinnitus and vertigo relieved; hearing unchanged.*—June 7, 1893. Mrs. G., aged fifty-five years, of Clearfield County, Pa., states that she had been dull of hearing in the left ear since childhood, with increasing tinnitus for many years. Three or four years ago she began to have attacks of ear-vertigo, but she was treated for "neurasthenia" by another physician. For the last year the attacks of vertigo have increased in frequency, occurring as often as once a week. Tinnitus is always worse at such times. The tuning-fork is heard in the left ear through the bones.

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[1] The numbering begins as a continuation of cases like those in the first series named above.

Examination of the ear revealed a retracted membrana and a plainly visible incus. The attacks of vertigo lately have obliged her to go to bed. They have come on, usually, suddenly and when she has been in the house. However, the last one, which was quite severe, came on while she was driving. There is no catarrh of the nares and pharynx. A loud voice can be heard close to the ear.

On June 7th, the patient being under ether, tympanotomy was performed, the incus-stapes joint exposed, and the incus, though tightly held in place, was removed. The stapes was found to be firmly anchylosed in the oval window, and upon pulling upon it with a small hook between the crura the latter broke. Within two weeks following there were one or two very slight attacks of vertigo which lasted but a few moments.

In the course of six months this patient became entirely free from vertigo, and was able to attend to her household duties.

Case XIII. *Cicatrized purulent otitis media, right-ear; perforation in the membrana tympani; incus plainly visible; deafness, tinnitus, and vertigo; removal of the incus; relief of all the symptoms.*—June 27, 1893. Sister St. —, aged thirty-two years, for many years has had chronic naso-pharyngeal catarrh. The patient has complained for some months of increasing tinnitus in the right ear, accompanied by vertigo, and now desires relief, especially from the latter. Hearing for the voice two feet for isolated words.

On June 28, 1893, the patient being under ether, I enlarged the perforation in the upper posterior quarter of the membrana tympani and removed the incus. There was no reaction in this case, and the patient, who left the city the day after the operation, was not seen for a month, when it was found that the hearing in the right ear was for whispered words from eight to ten inches, and for loud words from four to six feet. There had been no vertigo or tinnitus.

As late as June, 1894, the patient reported that she had remained entirely free from tinnitus and vertigo and that she had retained her improved hearing.

Case XIV. *Chronic catarrhal otitis media in both ears; deafness, tinnitus, and vertigo; removal of both incudes; entire relief from vertigo.*—July 19, 1893. Mr. C. C. T., of Maryland, aged thirty-one years. The hearing in this case began to fail eight years ago in the right ear and four years ago in the left. The patient had manifested marked ear-vertigo for a year, having grown much worse within two months, always being dizzy upon stooping and sometimes when walking in the street. There was most tinnitus of a whirring nature in the right ear; less tinnitus in the left ear. A loud voice could be heard in the right ear. The hearing was a little better in the left ear. A large tuning-fork could be heard very well in both ears through the bones.

On July 20th, the patient being under ether, I performed resection of the long process of the incus in both ears, the bodies of the bonelets being left *in situ*. The hearing improved in both of the ears. The tinnitus was greatly diminished, and there were no further attacks of ear-vertigo. In the course of two months the patient was able to resume his business as a bookkeeper on account of his improved aural condition. Unfortunately two months later he slipped upon an asphalt pavement on a wet day in Chicago, where he had gone to live, struck his head upon the curbstone and fractured his skull, dying in consequence thereof.

Case XV. *Chronic catarrhal otitis media in the right ear after mumps,* *tinnitus some years later; fifteen years later first attack of tympanic vertigo; removal of the incus; entire relief in the course of six months.*—October 2, 1893. Mr. J. C., of Ohio, aged thirty years, states that eighteen years ago after mumps his right ear became deaf, and in the course of two or three years he began to suffer from tinnitus in that ear. Three years ago in the evening, after a hard day's work in a shoe-store, he experienced his first attack of vertigo, before which, during the entire day, he observed that the tinnitus in the right ear was much worse. The attacks of vertigo became more and more frequent for three years during the winter and spring. During the summer and autumn he was comparatively free from them.

At the time of my first examination the tuning-fork was well heard in the right ear through the bones. Hearing for the voice in this ear was very much reduced.

On October 3d, the patient being under ether, I incised the membrana tympani in the upper posterior quadrant and removed the incus. There was no reaction, and the membrana tympani closed in a few days and the patient returned to his home. During the eleven following weeks the patient had two slight attacks of dizziness, but no reeling or vomiting. Under date of April 26, 1894, the patient informed me that he had had no attacks of vertigo except those mentioned above, since the operation, and that he considered himself entirely cured.

CASE XVI. *Chronic catarrhal otitis media in both ears; profound deafness and tinnitus aurium; intense vertigo, with reeling and falling at times; removal of both incudes; immediate and entire relief.*—October 11, 1893. Mr. W. R. T. P., of Philadelphia, aged fifty-eight years, formerly a sea captain, states that about fifteen months ago he first noted failure in hearing in the left ear and soon after in the right ear. A year ago he observed that he was at times vertiginous. Within three months of that time the attacks of vertigo became more frequent and intense. He never lost consciousness and fell, but he has been obliged to sit down in the street on the pavement, and sometimes to catch hold of posts, etc., in order to avoid falling.

The tuning-fork is heard through the bones in the right ear, but not in the left ear. The tinnitus aurium is not constant. He can hear the voice in the right ear by means of the ear-trumpet. The membranæ are normal in appearance and the incudes are plainly visible.

On October 16th, the patient being under ether, both incudes were removed. Two days after the operation it was observed that he could hear in the left ear much better than he had heard for a long time, while the hearing in the right ear appeared to be temporarily worse. The next day, however, the hearing in the right ear became as well as it was before the operation and has remained his better ear. The improved hearing in the left ear continued as long as the perforation in the membrana remained open. After it closed the hearing in the left ear became as poor as it was before the operation.

Two weeks after the operation, after a hard day's work, he noticed some tinnitus and felt a little dizzy, but these symptoms disappeared upon his lying down and resting. I have observed this case ever since the operation, and am able to record that there has been no attack of vertigo. The patient hears better in the right ear than he did before the operation and is fully able to transact all his business without even the fear of an attack of incapacitating vertigo.

CASE XVII. *Chronic catarrhal otitis media of the right ear; probably rendered worse by traumatism; deafness, tinnitus, and vertigo; removal of the incus; immediate relief.*—October 4, 1893. Mr. C. S., of Philadelphia, aged sixty years. The patient stated that four months before I first saw him he had fallen down stairs, striking the top of his head, and remained unconscious for two weeks thereafter. He states that he fell in consequence of an attack of vertigo as he was going upstairs to bed. Ever since his fall he has had attacks of uncertainty of gait at times, not attended with any increase of tinnitus. He said that his ears were well before his fall. Now there is constant tinnitus. Hearing for the tuning-fork through the bones reduced in both ears. Inspection of the right ear shows that the malleus is movable under the pneumatic speculum. The posterior half of the membrana is crinkled and white, but this part of the drum-membrane moves under the pneumatic speculum. The suction exercised by this instrument upon the membrana makes the ear feel better, but does not quell the tinnitus. The left membrana tympani is very white and lustreless.

In my opinion this patient has been the subject of chronic catarrhal otitis media in both ears for some time before his fall, as his vocation as an oysterman has exposed him to all kinds of bad weather. It seems to me that in consequence of the fall and blow upon the head that the trophic disturbances in the right ear became worse, although I am convinced that the chronic aural catarrh in the right ear induced the vertigo which led to the fall.

On October 23d, the patient being under ether, an incision was made in the upper posterior quarter of the membrana, and the incus, which was found very adherent, was removed. There was no inflammatory reaction in this ear, and in the course of four days there was decidedly less tinnitus and the man's gait was much more steady. In consequence of the diminished tinnitus he began to sleep much better at night, became much stronger and more active upon his feet, and felt well satisfied with the result of this operation.

The improvement in this man was maintained, as I am able to state from a prolonged observation of the case.

CASE XVIII. *Chronic catarrhal otitis media in the right ear, probably of traumatic origin; deafness, tinnitus, and vertigo; removal of the incus; immediate partial relief.*—November 20, 1893. Mr. W. H., of Philadelphia, aged fifty-six years, states that he was struck by a locomotive a year previously and thrown many feet into the air, and coming down struck upon his head, sustaining a compound comminuted fracture of the skull in the right upper parietal region. He remained unconscious and delirious for two weeks. Immediately upon leaving the hospital in Wilmington, Delaware, where he was taken after the accident, he observed deafness and tinnitus in the right ear, and has suffered from more or less tympanic vertigo ever since. Before the accident the right ear was perfect in every way. At the time of my first examination it was found that the tuning-fork was not heard well through the bones in the right ear and that deafness to ordinary vocal sounds was great.

On November 23, 1893, the patient being under ether, the incus was removed in order to relieve the tinnitus and tympanic vertigo. After the operation there was immediate partial relief from tinnitus and vertigo, and the hearing for the voice improved in the right ear, being heard as far off as six inches from the ear.

His memory and intellect became better in the course of two months, but he experienced some months later (February 8, 1894), during stormy weather, some tinnitus in the right ear and a little vertigo. This case remained decidedly improved regarding tinnitus and vertigo until the fall of 1895, when he suddenly became hopelessly insane, evidently from the injury to the skull and brain.

CASE XIX. *Chronic catarrhal otitis media; deafness and tinnitus; chronic tympanic vertigo more or less constant, with severe paroxysms; removal of the incus; entire relief.*—December 13, 1893. Mrs. K., of Maryland, aged forty-six years, states that over three years ago she suffered from a bad attack of catarrhal inflammation of the nose and head. Soon thereafter she experienced dulness of hearing and tinnitus in the left ear. Fifteen months later she began to suffer from vertigo in consequence of the irritation she experienced in the left ear. The vertigo was more or less constant with frequent bad paroxysms of increase—as often as two or three times a month. Examination revealed a very thick membrana tympani on the left side.

On January 23, 1894, the patient was etherized and the incus removed. There was immediate improvement in walking, and the patient felt entire confidence in going about alone. For some months before the operation she was unwilling to walk about without an attendant. I have heard repeatedly from this patient, and she has remained entirely free from the annoyance of chronic tympanic vertigo, but the hearing in the left ear is very poor. The hearing on the other side had been lost in early life through a chronic purulent otitis media.

CASE XX. *Cicatrized chronic purulent otitis media; persistent perforation; enlargement of the latter upward; removal of the incus; immediate and entire relief.*—February 1, 1894. Mr. W. P., of Philadelphia, aged thirty-four years, a clerk, consulted me regarding deafness and tinnitus in the right ear, followed recently by attacks of ear-vertigo.

Examination revealed on the right side a large heart-shaped perforation in the membrana tympani with cicatrized edges, the contents of the tympanum being plainly visible through the perforation. The patient had considerable naso-pharyngeal catarrh, which under antiseptic treatment of the nares improved, but the tinnitus and vertigo seemed to be entirely uninfluenced by the nasal treatment. Finally, by February 24th, the tinnitus and vertigo had increased to such an extent as to render the patient unable to walk about without an attendant. I advised removal of the incus, to which the patient acceded, and this operation was performed on March 2, 1894. There was immediate and entire relief from the vertiginous symptoms, but the tinnitus has continued more or less ever since the operation, though without its former intensity. The stapes in this case has remained plainly visible. There has never been any running from the middle ear, and the stapes is very easily movable by means of a probe, yet the hearing has never been much improved in this case by the operation, though the stapes, as just stated, is very movable.

CASE XXI. *Chronic catarrhal otitis media; deafness, tinnitus, and vertigo; resection of the long process of the incus; relief.*—March 14, 1894. Miss P., of New York, aged forty-seven years, has presented symptoms of chronic catarrh of the right middle ear for many years past. Within the last few years she has experienced several attacks of not very severe aural vertigo.

On March 16, 1894, the patient being under ether, the right membrana tympani, which was greatly thickened and retracted, was incised. The incus-stapes joint was not visible through the incision in the membrana tympani, but by means of the incus-hook the long process of the incus was drawn down into view. The incus being very adherent, the entire bone could not be removed, therefore the long process was seized by cutting-forceps and resection of this portion of the bonelet was effected.

There was no reaction, and in the course of two months the hearing had slightly improved, the tinnitus had lessened, and there had been no more attacks of vertigo. The patient has remained entirely free from such attacks up to the present time.

CASE XXII. *Chronic catarrhal otitis media, left side; deafness, tinnitus, and vertigo; removal of the incus; improvement in hearing; lessening of the tinnitus and relief from vertigo.*—March 21, 1894, Mrs. G., of Philadelphia, aged fifty-three years, was examined by me for the first time, and was found to present well-marked symptoms of chronic catarrh of both middle ears. The left ear was apparently the worse, and its condition was deemed to be the cause of the ear-vertigo. On March 21st, the patient being under ether, the left membrana tympani was incised and the incus exposed. It was found to be placed very high in the attic, but was finally drawn down and removed from the drum-cavity. In the course of four days this patient had some pain in the ear operated upon, not attended with discharge; but in a few days, under the application of dry heat, all pain ceased and symptoms of reaction disappeared. By April 18th it was reported by her physician, at whose suggestion I had operated, that the patient heard better, but that the tinnitus was no better. By April 25th the perforation in the membrana tympani had closed. The patient still complained of tinnitus in her head and ear, as she said, but she had had no attacks of dizziness, and so far as I know has remained entirely free from ear-vertigo up to the present time.

CASE XXIII. *Chronic catarrhal otitis media in both ears; deafness and tinnitus most marked in the right ear; vertigo; removal of the incus; relief.*—April 2, 1894. Mrs. E. J. C., aged fifty years, has presented symptoms of chronic catarrh of both middle ears for many years past. Within the last four months has had most tinnitus, deafness, and general discomfort in the right ear, from which she hears very little. The left ear is able to hear isolated words at a distance of one foot. This patient underwent an operation for ovariotomy four years ago. The ears seemed no worse after the operation until four months ago, when the right ear presented the symptoms named above. The tuning-fork was heard two inches through the air on the right side and four inches through the air on the left side. The right membrana tympani moves well under the pneumatic speculum, which manipulation of the ear renders the patient dizzy and uncomfortable. The membrana tympani was very obliquely placed in this subject, the malleus seeming to be drawn upward and backward, and the incus was not visible through the membrana.

On April 17, 1894, the patient being under ether, an incision was made in the membrana tympani and the incus was found to be placed very high in the attic. After forty-five minutes' patient labor the incus was drawn into view and removed. There was no relief in this case for ten days. On April 27th, however, the patient said that she could hear better, and it was found that she could hear the tuning-fork through the air an inch or two further than she could before. The patient stated that the words she now heard were much more plainly distinguished than they were before. Formerly they all ran together, but now she could hear words much more distinctly than before the operation. The tinnitus was much lessened. The tongue in this case was somewhat numb on top for some time after the operation, a condition due to irritation of the chorda tympani. This sequel of the operation, however, disappeared in a short time, and the patient has remained free from vertigo.

Case XXIV. *Chronic catarrh of the left middle-ear; hysterical subject; deafness, tinnitus, and vertigo; removal of the incus; no relief.*—December, 1895. Miss R., of North Carolina, aged twenty-five years. For several years this patient has presented symptoms of chronic catarrh of the left middle ear, with increasing deafness and tinnitus. Last summer, after prolonged nursing day and night, of an ill relative, she suffered from marked nervous prostration, with increased tinnitus in the left ear, and attacks of ear-vertigo from the irritation in the ear.

Examination revealed that the voice could be heard close to the left ear. A watch was not heard on contact. On December 31, 1895, the patient being under ether, the upper posterior quadrant of the membrana tympani was freely cut away at its periphery and turned forward, and the incus-stapes joint exposed. The incus was easily separated from the stapes and removed.

In the course of a week the tinnitus was said to be less and the vertigo relieved; but subsequently with general hysterical conditions the tinnitus and vertigo seemed to be no better. The case went home about the first of February, 1896, and has been lost sight of.

Case XXV. *Slight symptoms of chronic catarrh of both middle ears for eight years; tinnitus and dulness of hearing in both ears; finally tinnitus and deafness most marked in the right ear; intense vertigo from irritation in the latter; removal of the incus; relief.*—February 7, 1896. Mr. E. M. B., of Westmoreland County, Pa., aged thirty-seven years, a farmer, states that he first noted tendency to vertigo in 1888. There was no tinnitus at that time. The first attack of vertigo came on at night, and was severe enough to cause vomiting. He suffered from headache for several days thereafter. There were three or four attacks of vertigo in the three or four subsequent months, there being no relief from these attacks until he vomited. Two years later tinnitus was added to the symptom of vertigo. There came a period of relief, however, from these attacks between May, 1888, and May, 1890, after his vision was corrected. The hearing then began to fail, and the attacks of vertigo began again, and seemed to be more intense in their character. The tinnitus which appeared in both ears grew worse in the right ear, and is now very much worse in the right ear. Since 1892 he has had constant symptoms of ear-vertigo. Inspection reveals a membrana tympani normal in appearance, but that the malleus is nearly immovable under the pneumatic speculum. There is constant and distressing tinnitus in the right ear. The tuning-fork cannot be heard through the bones on the right side; the nares and pharynx are in good condition. The tuning-fork is heard between one and two inches through the air on the right side and from two to four inches through the air in the left ear. The knee-jerk is fair; but the patient walks badly, especially with his eyes closed and in the dark. He sleeps poorly, and is very apprehensive that he will fall if he walks about. His spirits are fairly good and his intellect entirely clear. There is no history of any syphilitic taint nor of any hereditary dyscrasia. His physician, who accompanied him, stated that he believed him to be of a good constitution. The patient had reached the condition which made him unwilling to walk about alone; he had rather an anxious expression, and his pupils were widely dilated.

Thinking there might be some cerebellar disease, I asked the patient to consult Dr. Sinkler, who informed me that "although it might be thought at first sight that Mr. B.'s case was one of cerebellar disease, the absence of some important features made him believe that the disease was purely aural vertigo, the most intense form, however, he had ever seen."

On February 8, 1896, the patient being under ether, the right membrana tympani was incised in the upper posterior quadrant and the incus-stapes joint revealed. The incus was easily detached from the stapes and removed from the drum-cavity. The patient grew better in the course of a week, was fully able to walk about the city alone, and was no longer made dizzy by objective noises, as he was for some time before the operation, when even the sound of his own voice would make him dizzy at times. This was effected, as I think, by the sound of the voice impinging on the membrana tympani and increasing the inward pressure of the anchylosed malleus and incus upon the stapes.

The tinnitus in this case remained more or less distressing, although the gait was so much improved and the vertigo vanished. The patient returned to his home in ten days after the operation.

Under date of February 24th the patient wrote that he at times had considerable tinnitus and slight tendency to dizziness, which made him feel rather timid about walking.

Under date of March 13, 1896, his physician wrote that, although Mr. B. had had considerable tinnitus and one or two bad attacks of vertigo, on the whole his condition was very much better than before the operation.

Under date of April 16th his physician writes again that the patient suffers a good deal still from tinnitus, but the tendency to vertigo is slight, and that the hearing in the ear operated upon is slightly improved, as he hears some sounds now which he did not hear before the operation. There has been no vertigo bad enough to make the patient fall, but the dizziness at times is pretty bad. He is able, however, to be up, and does some work about the house, though he is in fear of an attack of vertigo.

I believe this case is presenting the same features that some other cases of ear-vertigo have shown, namely, a gradual improvement after operation in a condition which came about gradually for many years. By reference to the notes it will be seen that this man suffered with increasing symptoms of ear-vertigo for eight years and that he was at last unable to walk about alone. Immediately after the operation and ever since he has been able to walk about alone, although he is not entirely free from tinnitus and ear-vertigo.

Under date of April 24th his physician wrote that the patient is much discouraged by a continuation of general tinnitus and considerable dizziness. This condition may be due to the catarrhal state of the left ear, which it must be remembered was nearly as much affected as the ear operated upon. If this tendency to vertigo does not abate, an operation upon the left ear should be contemplated, as in two of the worst cases reported both ears were operated upon with the best results.

CASE XXVI. *Chronic purulent inflammation of the attic; slight discharge; deafness, tinnitus, and vertigo; removal of the remnant of the malleus; relief of all the symptoms.*—February 26, 1896. L. —., of Philadelphia, aged twenty-one years, complains that she has suffered from noise and deafness in the left ear for some time, and of late with frequent attacks of dizziness which oblige her to hold on to a support to prevent her falling. Otoscopic examination revealed a suppuration in the left attic space, with a large perforation in the membrana flaccida, through which the neck of the malleus could be seen. The membrana vibrans was seen to be greatly thickened, cicatrized, and indrawn.

February 29, 1896, the patient being under ether, I cut downward and backward from and through the posterior edge of the perforation in the flaccid membrane corresponding to the posterior fold of the membrana tympani, sweeping around and beneath, forward and in front of the malleus, and removed the latter bonelet. Its head was found to have been destroyed by necrosis, and the incus was not found. The purulent discharge ceased at once, the tinnitus was quelled, and there were no more attacks of vertigo during the few weeks after the operation the patient remained in the Presbyterian Hospital.

As already stated, in all of these cases the intratympanic operation was performed primarily for the relief of chronic tympanic vertigo of chronic catarrhal origin. It is very instructive, however, to note the incidental effects of the operations upon the accompanying tinnitus and deafness.

All the operations were performed upon the etherized patient, and the ear being previously mopped or syringed with a bichloride solution, was illuminated by means of a six-volt electric lantern held on the operator's forehead with the ordinary forehead-band, like that used for holding the forehead-mirror. The current was supplied by a small portable (11½ pounds) storage-battery, made for me by the Electro-dynamic Company, of Philadelphia. No inflammatory reaction with discharge ensued after any of the operations excepting in Case XI., in which total excision of the membrane was performed; but, as stated already, I have abandoned that operation in such cases. In Case XXI. there was some pain, but no discharge from the ear, for a few days after the removal of the incus, as may be learned by reference to the notes.

Most of the cases (12) presented the ordinary symptoms of chronic catarrh of the middle-ear, without symptoms of previous purulency.

Three cases, however, presented symptoms, as well as the history, of having suffered from chronic purulency of the middle-ear; two with large perforations in the membrana, with cicatrized edges and cicatrized drum-cavity (Cases XIII. and XX.), and one with a cicatrized perforation and partly destroyed malleus (Case XI.). One case (XXVI.) presented a condition of active purulency in the attic at the time of the operation.

The following synopsis of results of the operations in these sixteen additional cases of chronic tympanic vertigo shows that the highest average of success was attained in the relief of vertigo, as in the first series. In the incidental results of the operations the tinnitus shows a higher average of relief than the deafness. In Cases XI. and XXIV. there was no relief in any respect.

*Results.* Vertigo relieved at once in ten cases; vertigo relieved gradually in four cases; vertigo unchanged in two cases; tinnitus lessened in thirteen cases; tinnitus unchanged in three cases; hearing improved in nine cases; hearing unchanged in seven cases.

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# SOME INVESTIGATIONS AS TO THE VIRULENCE OF THE DIPHTHERIA-BACILLI OCCASIONALLY FOUND IN THE THROAT-SECRETIONS IN CASES PRESENTING THE CLINICAL FEATURES OF SIMPLE ACUTE ANGINA.

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It is very difficult to dislodge from the minds of most practitioners of medicine the purely anatomical conception of diphtheria. Up to the period beginning with the discovery of the Klebs-Löffler bacillus and the development of the methods of bacteriological examination in the diagnosis of this disease, diphtheria was generally regarded as an inflammation of the respiratory mucous membrane, characterized by the formation of a false membrane, and this false membrane was considered to be the diagnostic feature of the disease.

Notwithstanding that previous clinical experience had shown that this was not a reliable criterion for the diagnosis of diphtheria, and notwithstanding that the evidence derived from thousands of bacteriological examinations in acute throat-affections has demonstrated the fallacy of this view, there still remains the firm belief with a large proportion of the profession that only such cases of acute angina are to be regarded as diphtheria as present at some time in their course more or less membrane. So thoroughly has this idea become fixed, and so strong is its influence upon practice, that many even of those physicians who unhesitatingly accept the Klebs-Löffler bacillus as the essential cause of diphtheria are still guided by it in their sanitary treatment of cases of true diphtheria which simulate simple angina, and they do not regard the isolation and subsequent observation of such cases as either necessary or advisable.

Physicians readily enough acquiesce in the isolation of cases of mild scarlatina or variola until complete desquamation has occurred, and no question arises as to the danger of transmission of such diseases to other persons through contact with mild forms; but similar reasoning is not allowed to apply to diphtheria.

The observations of Roux, Koplik, Park, and others long ago proved that simple catarrhal angina, or what seemed to be clinically simple catarrhal angina, might be caused by the diphtheria-bacillus. This fact was clearly brought out in an admirable paper by Koplik, published in 1892. Long before this time Trousseau, Jacobi, and other clinicians had shown that frequently during epidemics of diphtheria clinical anginas occur which are as prostrating as those associated with the formation of membrane; and, in 1890, Roux directed attention to the fact that such cases, or very mild forms of angina without subsequent prostration, were not infrequently the origin of severe epidemics of diphtheria. The investigations of many observers, on the other hand, have proved that the presence of membrane does not necessarily indicate the existence of diphtheria, as membranous inflammations of the throat may be produced by other organisms than the diphtheria-bacillus.

The purpose of the series of investigations detailed in this paper was to fix the exact value to be attached to the ordinary routine bacteriological examinations in determining the true character of the cases described. It was desired to ascertain in how large a proportion of the cases of simple acute angina the diphtheria-bacilli would prove to be virulent in animal-tests when they appeared to be typical in form and staining. Previous experience had led us to believe that the bacilli in such cases were almost invariably fully virulent.

The cultures selected for the observations were chosen from those received at the New York Health Department laboratories, in which diphtheria-bacilli were apparently found on microscopical examination and in which the physician's diagnosis was doubtful or was tonsillitis. In some instances the diagnosis accompanying the cultures was simply tonsillitis; in others it was follicular, ulcerative, membranous or pseudo-diphtheritic tonsillitis, or pseudo-diphtheria, or acute pharyngitis, or diphtheria with an interrogation-point. When cultures were received that had some such diagnosis as those referred to, and microscopical examination showed that they contained apparently typical diphtheria-bacilli, the bacilli were plated out, pure cultures obtained, and their virulence then tested upon guinea-pigs in the usual manner.

The bacilli derived from cultures made from forty-eight cases of this type were tested, and in only three instances were the organisms found to be non-virulent. In all of the remaining forty-five cases the animal-tests showed them to be fully virulent. I may say, in passing, that before the virulence of any culture was tested the character of the bacteria present in it was usually passed on by Dr. John S. Billings, Jr., and Mr. Alfred L. Beebe, who commonly make the routine examinations, and Dr. William H. Park and Dr. Anna L. Williams, who plated out the cultures and tested the bacilli for virulence. All these persons have had a very large experience in bacteriological work connected with diphtheria, and it will be readily understood that many cultures were thrown out as not showing typical Löffler bacilli, although they would be generally regarded as such. The subsequent history of the cases was obtained from the attending physicians by inspectors of the Health Department, and inquiry was made in each instance as to the source of infection and as to the occurrence of other cases in the family.

In four of the forty-eight cases the subsequent history could not be obtained. Of the remaining forty-four, fourteen presented throughout their illness the clinical features of typical acute follicular tonsillitis, and in all of these the reports showed that the cases were of a mild character, and convalescence was fully established in from three to five days. In three instances the course of the disease was that of a simple acute pharyngitis of a mild type. In none of these seventeen cases was there any membrane in the throat at any time during the illness, and nothing in the clinical history suggested diphtheria. In a number of them the original cultures were sent by the physician in attendance, because one or more cases of diphtheria had already occurred in the family or in the institutions in which the patients were inmates, and in others the cultures were sent simply as a matter of routine, as is frequently done by many physicians in New York City. In one additional case the early history was that of a follicular tonsillitis, from which the child was apparently entirely convalescent, when suddenly croup developed with laryngeal stenosis, and intubation was required; in another the history was that of a follicular tonsillitis, excepting that after three or four days' illness the child became hoarse and had a croupy cough. No antitoxin was administered, however, and the patient soon recovered. In the remaining twenty-five cases, while originally the diagnosis by the attending physician was follicular tonsillitis or was considered to be doubtful, ultimately membrane appeared, and the course of the disease finally was that of a more or less severe diphtheria.

Excluding the twenty-five cases in which ultimately the patients developed characteristic symptoms of diphtheria, there remain the nineteen cases which were clinically follicular tonsillitis or pharyngitis, with in two instances the development late of some laryngeal symptoms. In seventeen of these the tests upon animals showed that the bacilli found in the cultures were fully virulent.

In the analysis of this series of nineteen cases of apparently simple angina, associated with the presence of the Löffler bacillus, as to the history of contagion, it was found that four occurred among the inmates of various institutions for children, in which diphtheria was at the time prevailing. In six of the remaining there was a history of previous or subsequent cases in the family, or the child was known to have been in contact with some person suffering from diphtheria. The history on this point in four cases was not given. It will be seen, therefore, that in ten out of fifteen in which the history was obtained there was reasonable evidence of contagion.

Examination was also made of the records in these nineteen cases to show the duration of persistence of the Löffler bacillus. This could be determined in fifteen of the series. The Löffler bacilli had disappeared in most of these cases within eight days of the time of the first culture. In one instance, however, they persisted for twelve days, in another for eighteen, and in another for thirty days. No subsequent tests for virulence were made during the persistence of the bacilli.

An important question arises in this connection as to the frequency with which true diphtheria simulates simple angina. There are no data at the command of the Health Department in New York which throw any light upon this phase of the subject. It has been found, however, that where virulent diphtheria-bacilli are present in normal throats, as a rule, the history will disclose some recent exposure to diphtheria, and in a majority of the cases here described investigation proved that there was a definite source for the contagion.

From April 1st to the 28th notes were made of the clinical and bacteriological diagnosis in every case from which cultures were received in the New York municipal laboratories. The number of cultures examined was much smaller during April than during some of the winter months. For this period, however, 2042 cultures were examined. Of these, 915 were primary, 944 were secondary, and 183 were trial cultures—that is, were made from the healthy throats of persons who had been in contact with diphtheria. Of the 915 primary cultures about one-half, 450, were made by the attending physicians. The clinical diagnoses accompanying the slips in these cultures were as follows: In 54 cases, false diphtheria (usually tonsillitis); in 145, diphtheria or croup; and in 241 the diagnosis was doubtful or blank. The result of the bacteriological examination was as follows: False diphtheria, 110, in contrast with 54 diagnosticated as such; true diphtheria, 239, in contrast with 145 diagnosticated as such; and 241 in which the diagnosis was doubtful or blank. In 91 cases the bacteriological diagnosis was doubtful, either because the cultures were made too late in the disease, or were contaminated, or were unsatisfactory for some other reason.

It therefore appears that out of 450 primary cultures received from physicians from April 1st to 28th inclusive, only 239, a little more than half, proved to be true diphtheria. During this same period there were reported to the department, as diphtheria, 107 cases in which no cultures were made by the attending physicians, but those later made by the inspectors of the Department, on bacteriological examination showed no diphtheria-bacilli, and the cases were therefore declared to be false diphtheria.

These data dispose of the statement which has been so constantly made and reiterated, that, as the result of the general adoption of bacteriological examinations for the diagnosis of diphtheria, the total number of cases of this disease has been largely increased by the addition of many cases of tonsillitis and pharyngitis which were previously regarded as simple anginas. As will be seen during the period referred to, 107 cases considered as diphtheria and reported as such to the Health Department were excluded from the lists of reported cases of diphtheria by the bacteriological examination. During this same period only eighty cases considered by the physicians to be false diphtheria or of a doubtful nature were found on bacteriological examination to be true diphtheria.

There are no data at hand to show the exact proportion of cases reported as follicular tonsillitis which, on bacteriological examination, prove to be true diphtheria. The proportion, however, is small.

A large number of cultures is sent to the Department in which no clinical diagnosis is given. Some of these prove to be cases of true diphtheria and some false. Whether they present the clinical features of diphtheria, the Department has no means of ascertaining. Comparatively few physicians, however, send cultures from cases showing only the symptoms of follicular tonsillitis unless there are some reasons for suspecting the affection to be of a diphtheritic character.

The observations made on the cases detailed in this paper, while not very numerous, yet when taken in connection with those previously made in the Health Department laboratories, and the observations of Koplik and others, are sufficiently conclusive in showing that when diphtheria-bacilli typical in appearance are found in cultures obtained from cases of simple angina (cases in which there is no membrane), animal-tests, in a large majority of instances, prove that the bacilli are fully virulent. In other words, when morphologically typical diphtheria-bacilli are found in cultures made after the rather rude methods employed in diagnostic work, the result of the examinations may be generally accepted as indicating the existence of virulent diphtheria-bacilli, and the cases are to be regarded as cases of true diphtheria, unless animal-tests have shown the organisms to be non-virulent.

| No. | Date. | Physician's diagnosis accompanying cultures. | Result of bacteriological examination. | Result of animal inoculation. | History of the case. | As to infection of others. | How contracted. | Remarks. |
|---|---|---|---|---|---|---|---|---|
| 1 | ......... | Follicular tonsillitis. | Typical diphtheria bacilli. | Virulent. | Typical follicular tonsillitis; exudate disappeared in three days. | None. | ............... | |
| 2 | ......... | Follicular tonsillitis. | Typical diphtheria bacilli. | " | Typical follicular tonsillitis; exudate disappeared in three days. | None. | ............... | |
| 3 | 1896<br>Jan. 7 | Diphtheria ? | Many suspicious bacilli; a few typical diphtheria bacilli. | " | Clinically an acute pharyngitis; very mild. | 2 cases: 1 mild; 1 very mild. | From brother. | No membrane present at any time. |
| 4 | " 9 | Ulcerative tonsillitis. | Typical diphtheria bacilli. | " | Severe; septic; mixed infection; died. | ? | ............... | Antitoxin not administered. |
| 5 | " 9 | Diphtheria ? | Typical diphtheria bacilli. | " | Typical follicular tonsillitis, no membrane. | None. | ............... | |
| 6 | " 13 | Membranous tonsillitis. | Typical diphtheria bacilli. | " | Mild; tonsillar membrane, disappearing after three days. | Diphtheria prevailing in the institution. | | Inmate of charitable institution; removed to Diphtheria Hospital. |
| 7 | " 13 | Membranous tonsillitis. | Typical diphtheria bacilli. | " | Mild; tonsillar membrane, disappearing after four days. | Diphtheria prevailing in the institution. | | Inmate of charitable institution; removed to Diphtheria Hospital. |
| 8 | " 14 | Diphtheria ? | Many very suspicious bacilli; a few typical diphtheria bacilli. | " | Mild; tonsillar membrane, disappearing after three days. | Diphtheria prevailing in the institution. | | Inmate of charitable institution; removed to Diphtheria Hospital. |
| 9 | " 16 | Diphtheria ? | Typical diphtheria bacilli. | " | A typical case of fairly severe true diphtheria. | None. | Not known. | |
| 10 | " 16 | Tonsillitis. | Typical diphtheria bacilli. | " | Typical case of true diphtheria. | 5 cases; the 4th case severe; the other cases mild. | ............... | Attending physician habitually marks slips accompanying cultures "tonsillitis." |
| 11 | " 18 | Tonsillitis. | Typical diphtheria bacilli. | " | Mild, slightly ill; no other particulars could be obtained. | None. | ............... | Antitoxin administered twice. |
| 12 | " 19 | Follicular tonsillitis. | Typical diphtheria bacilli. | " | Clinically follicular tonsillitis; very mild; not confined to bed. | None. | Possibly from case in house. | |
| 13 | " 19 | Pseudo-diphtheria. | Typical diphtheria bacilli. | " | Mild at first; later clinically true diphtheria with extensive membrane. | None. | ... ........... | Antitoxin administered. |
| 14 | " 20 | Follicular tonsillitis; possibly diphtheria. | Extremely small diphtheria (?) bacilli. | " | Very mild tonsillitis; no false membrane at any time. | None. | ............... | Patient well isolated. |
| 15 | " 19 | Tonsillitis. | Small, rather atypical bacilli. | Non-virulent. | Mild; "seemed to be tonsillitis clinically." | ............... | ............... | |
| 16 | " 22 | Doubtful. | Large, pointed diph.(?) bacilli. | Virulent. | Not obtained. | ............... | ............... | |
| 17 | " 22 | Suspected diphtheria. | Very small typical diphtheria bacilli. | " | Severe. | Not known. | Not known. | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 18 | Jan. | 25 | Tonsillitis. | A few large, fairly typical bacilli. | Virulent. | A mild typical tonsillitis; not confined to bed; well in five days. | None. | Possibly from child in family. | |
| 19 | " | 26 | Follicular tonsillitis. | Small number of fairly typical bacilli. | " | Mild; course that of a true diphtheria; typical membrane. | None. | ............... | |
| 20 | " | 27 | Measles. | Typical diphtheria bacilli. | " | Severe; course that of a true diphtheria; paralysis of lower extremities. | None. | From a case of membranous croup. | |
| 21 | " | 27 | Nasal diphtheria? | Typical diphtheria bacilli. | " | Mild; no constitutional symptoms; nasal diphtheria. | None; no other children in family. | ............... | Antitoxin not administered; treated at dispensary during whole illness. |
| 22 | " | 27 | Diphtheria? | Typical diphtheria bacilli. | " | Mild at first, and diagnosis doubtful; became severe; course that of true diphtheria. | None. | ............... | Adult; antitoxin administered. |
| 23 | " | 27 | Diphtheria? | Moderate number typical diphtheria bacilli. | " | Mild; course that of a typical acute tonsillitis. | None. | ............... | |
| 24 | " | 28 | ? | Typical diphtheria bacilli. | " | Mild; course that of a typical tonsillitis. | None. | ............... | Antitoxin not administered. |
| 25 | " | 28 | Follicular tonsillitis. | A few fairly typical bacilli. | " | Very mild; clinically follicular tonsillitis; no membrane. | None. | From aunt in same house. | |
| 26 | " | 30 | Diphtheria? | Typical diphtheria bacilli. | " | Mild; tonsillar diphtheria; membrane disappeared after two days. | Diphtheria prevailing in the institution. | | Inmate of an institution; removed to Diphtheria Hospital; antitoxin administered. |
| 27 | " | 30 | Tonsillitis? | Typical diphtheria bacilli. | " | Moderate; no membrane. | Diphtheria prevailing in the institution. | | Inmate of an institution; removed to Diphtheria Hospital; antitoxin administered. |
| 28 | " | 29 | Pseudo-diphtheria. | Typical diphtheria bacilli. | " | Clinically a case of true diphtheria; extensive membrane. | None. | From another case in same family 3 days previous. | |
| 29 | " | 30 | Membranous tonsillitis. | Typical diphtheria bacilli. | " | Moderate severity, tonsillar membrane disappearing after three days. | Diphtheria prevailing in the institution. | | Inmate of an institution; removed to Diphtheria Hospital; antitoxin administered. |
| 30 | " | 30 | Follicular tonsillitis. | Abundant atypical diphtheria bacilli. | " | Mild; typical follicular tonsillitis; no false membrane at any time. | Diphtheria prevailing in the institution. | | Inmate of an institution; removed to Diphtheria Hospital; antitoxin administered. |
| 31 | " | 30 | Follicular tonsillitis. | Typical diphtheria bacilli. | " | Mild; typical follicular tonsillitis at first; tonsillar membrane disappearing after three days. | Diphtheria prevailing in the institution. | | Inmate of an institution; removed to Diphtheria Hospital; antitoxin administered. |
| 32 | Feb. | 3 | Follicular tonsillitis. | Typical diphtheria bacilli. | " | At first typical follicular tonsillitis, but membrane appeared (tonsillar) and persisted for five days. | Diphtheria prevailing in the institution. | | Inmate of an institution; removed to Diphtheria Hospital; antitoxin administered. |
| 33 | " | 6 | Follicular tonsillitis. | Typical diphtheria bacilli. | " | Clinically true diphtheria; very severe. | None. | Not known. | Antitoxin not administered. |
| 34 | " | 11 | ? | Typical diphtheria bacilli. | " | Mild; typical follicular tonsillitis; croupy and hoarse on third day. | None. | Not known. | Antitoxin not administered. |
| 35 | " | 11 | Non-diphth. tonsillitis. | Typical diphtheria bacilli. | " | Very mild, simple acute pharyngitis; no false membrane. | None | Not known. | Case recovered in three days. |

| No. | Date. | Physician's diagnosis accompanying cultures. | Result of bacteriological examination. | Result of animal inoculation. | History of the case. | As to infection of others. | How contracted. | Remarks. |
|---|---|---|---|---|---|---|---|---|
| | 1896 | | | | | | | |
| 36 | Feb. 12 | Follicular tonsillitis. | A few bacilli, typical in shape; but with even staining. | Virulent. | Course of disease that of a true diphtheria. | ............... | ............... | |
| 37 | " 18 | Tonsillitis? | Typical diphtheria bacilli. | Non-virulent. | Clinically an acute tonsillitis, very mild. | Diphtheria prevailing in the institution. | | Inmate of an institution. |
| 38 | " 18 | Tonsillitis? | Typical diphtheria bacilli. | Virulent. | Clinically a case of true diphtheria, mild. | Diphtheria prevailing in the institution. | | Inmate of an institution. |
| 39 | " 16 | Diphtheria? | Typical diphtheria bacilli. | " | Began with convulsions and high fever; at first apparently follicular tonsillitis; later scarlet fever and diphtheria. | None. | None. | |
| 40 | " 27 | Diphtheria? | Small, but typical diphtheria bacilli. | " | Clinically a very mild case of acute tonsillitis. | Diphtheria prevailing in the institution. | | Inmate of an institution. |
| 41 | " 27 | Diphtheria? | Typical diphtheria bacilli. | " | Not obtained. | Not known. | Not known. | |
| 42 | March 4 | Pharyngeal diphtheria? | Typical diphtheria bacilli. | " | No information obtainable. | Not known. | Not known. | |
| 43 | " 6 | Rhinitis and laryngitis. | Typical diphtheria bacilli. | " | No information obtainable. | Not known. | Not known. | Inmate of an institution. |
| 44 | " 8 | Pseudo-diphtheria. | Typical diphtheria bacilli. | " | Clinically appeared to be a very mild acute pharyngitis; no membrane. | ............... | From another case in family. | Except for occurrence of previous case no culture would have been taken. |
| 45 | " 11 | Acute tonsillitis. | Typical diphtheria bacilli. | " | A moderately severe true diphtheria; extensive membrane. | ............... | From another case (memb. croup) in same family, but in another house. | This and succeeding case in same family. |
| 46 | " 11 | Acute tonsillitis. | A few typical diphtheria bacilli. | " | A moderately severe true diphtheria; extensive membrane. | ............... | Same as above. | This and previous case in same family. |
| 47 | April 5 | Follicular tonsillitis. | Typical diphtheria bacilli. | " | At first follicular tonsillitis, throat had cleared up; then severe croup requiring intubation. | Not known. | Not known. | |
| 48 | " 6 | Follicular tonsillitis. | Typical diphtheria bacilli. | " | Appeared finally to be a moderately severe case of true diphtheria. | 1 case, same family. | Not known. | Antitoxin administered; case recovered. |

We may refer, in conclusion, to the following classes of causes :

*First.* The healthy throats in which diphtheria-bacilli are present. In these cases investigation almost always shows that the individuals have been in contact with cases of diphtheria. The presence of the bacilli in the throat without any lesions does not, of course, indicate the existence of the disease.

*Second.* The simple anginas in which virulent diphtheria-bacilli are found. These are to be regarded, from a sanitary standpoint, in exactly the same way as cases of true diphtheria.

*Third.* Cases of true diphtheria presenting the ordinary clinical features of diphtheria and showing the Löffler bacilli.

*Fourth.* Cases of angina associated with the production of membrane in which no diphtheria-bacilli are found. These might be regarded, from a clinical standpoint, as diphtheria; but bacteriological examination shows that some other organism than the Löffler bacillus is the cause of the process.

It may be urged that the cases described in this paper were possibly instances of streptococcus-inflammation of the throat in which diphtheria-bacilli chanced to be present in the throat-secretions and were only accidental accompaniments and not the cause of the inflammation. This inference does not appear to be justified, and the only excuse for it would seem to be the desire to retain the anatomical conception of diphtheria—*i. e.*, that it is always an inflammation associated with the formation of a false membrane. It is this conception which I particularly wish to combat, and I desire especially to emphasize the statement that all inflammations of mucous membranes due wholly or in part to the Klebs-Löffler bacillus should be included under the name diphtheria without reference to the site or extent or intensity of the inflammatory process or the character of the exudate.

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# SUBPLEURAL PULMONARY ABSCESS,

## WITH REPORT OF CASES.

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No disease of the lungs presents more difficulties to the student than abscess, not only on account of its rarity and of the uncertainties of diagnosis, but also because the various forms of abscess not being clearly discriminated from one another, there is an apparent discordance between the observations of the pathologist and of the clinician. The former finds what seems irreparable destruction of pulmonary tissue at the autopsy. The latter reports cases of large abscesses which terminate in quick recovery. Hence according to their standpoint, leading authorities differ widely as to the frequency and prognosis of pulmonary abscess. The diagnosis in cases which recover is often involved in doubt, and the disease when present not rarely fails of recognition. It is thought to be important to report all observations, however imperfect, which can throw any light upon this subject. I have endeavored, as far as possible, to base my conclusions upon objectively determined facts rather than upon my interpretation of physical signs. Whether or not the views advanced meet with acceptance, it is hoped that they may at least serve as a stimulus to further study of this obscure subject.

Case I.—Sergeant S., of the 8th U. S. Infantry, a man twenty-six years of age, and of good previous health, was treated for several days in the post-hospital of Fort McKinney, Wyoming, for a bronchial catarrh of moderate severity, a mild form of influenza prevailing at the time, and was returned to duty before he had completely recovered, but at his own request, on November 24, 1891. He was seized with severe and repeated chills during the afternoon of the same day, and was readmitted to the hospital in the evening. The patient's temperature was unusually slow in rising. Otherwise the disease pursued, apparently, the usual course of acute croupous pneumonia, the left lower lobe being the part of the lung affected. The pulse was from the beginning so small, feeble, and irregular that an unfavorable issue was anticipated. A supporting treatment was instituted and alcoholic stimulants with ammonium carbonate were given from an early period. On December 1st the patient's condition was such that it was hardly expected that he would survive twenty-four hours, but very free stimulation and hypodermatic injections of strychnine carried him through the night. During the following days there was a slight improvement in the breathing, pulse, and temperature, but the patient developed a most troublesome cough, attended by no characteristic expectoration and evidently of a reflex nature. He was unable to turn upon either side without aggravating the paroxysms of coughing to an alarming degree. The urine was highly albuminous. An evening rise of temperature of one or two degrees began to declare itself, accompanied by exhausting sweats. Physical examination of the left side of the chest on December 17th showed vesiculo-tympanitic resonance and broncho-vesicular breathing anteriorly. In the axilla there was flatness on percussion with absence of breath-sounds and of vocal fremitus. The heart was thought to be slightly displaced to the right. Although it was impossible to examine the back, it was decided that there was sufficient evidence of the presence of empyema to warrant an exploratory puncture. Aspiration was accordingly performed, the needle being inserted in the sixth intercostal space in the mid-axillary line. A thin, odorless pus began to flow when the needle had penetrated about three-fourths of an inch, and twenty-three ounces were withdrawn. On the following day a second aspiration removed twenty-five ounces of pus. The diagnosis of empyema having been made, as it was supposed, the question of further operative interference presented itself. After consultation with my colleague, Assistant Surgeon H. A. Shaw, U. S. Army, the immediate performance of pleurotomy was decided upon.

On December 22d, a small quantity of pus having been obtained by aspiration at the same depth as in the previous operations, Dr. Shaw plunged a sharpened director through the sixth intercostal space in the mid-axillary line, the parts having been made anæsthetic by cocaine, and, passing a bistoury along it, rapidly made an incision two inches in length. Instead of the flow of pus which was expected, there was only a slight oozing of frothy blood from the wound. The sun shone brightly upon the wound, and looking through it into the chest we saw that the pleural cavity was absolutely empty. The lung, which was covered with a smooth coat of fibrin, was retracted laterally, but not vertically, the weight of the abscess no doubt preventing retraction upward. An aspirator-needle passed through the wound and into the lung reached pus as soon as the pulmonary pleura had been penetrated.[1] In doing this the whole length of the needle and a small portion of the attached rubber-tubing were introduced into the cavity of the chest, showing a lateral retraction of the lung of about four inches. The patient appeared slightly, if at all, affected by the collapse of the lung. A large antiseptic dressing was applied to the wound, which healed without suppuration in a few days, after which the pneumothorax soon disappeared.

During the following month the patient's temperature ranged between 98° and 101°, with oscillations of about one degree between the morning and evening temperatures. The pulse-rate was constantly above 100, and the respirations fell from an average of 30 in the first part to an average of 20 in the latter part of the month. The cough continued to be harassing, and the patient became much emaciated. The albumin had gradually disappeared from the urine. During the last days of January the range of temperature and the rate of respiration increasing, it was decided to resume the aspirations. (Chart I.)

On February 1st pus to the amount of 12 ounces was withdrawn at the same point and from the same depth as previously. The aspirations were continued as follows: February 2d, 15 ounces; February 3d, 14 ounces; February 4th, 14½ ounces; February 5th, 14 ounces; February 6th, 13 ounces; February 7th, 16 ounces; February 8th, 13½ ounces; February 9th, 2½ ounces, the total amount withdrawn in this series of aspirations being 114½ ounces. The patient's sensations served in general as the guide as to the time when the aspirations should be stopped, but on February 8th the aspiration was continued until the needle failed to draw and the pus was noticeably thinner. On the following day but 2½ ounces of a sero-pus could be obtained, and the abscess-cavity was thought to have been emptied. On February 22d the aspirations were again resumed and pus to the amount of 15, 15, 12, and 4½ ounces was removed on successive days, the pus of the last aspiration being again thinner and mixed with serum. It was then decided to test the effect of a repeated emptying of the sac, and the aspirations were continued four days longer, until February 29th. Three ounces of a cloudy serum were obtained at each of these operations. The patient now began to improve rapidly in health, and his cough had become much less troublesome. After February 29th his pulse, respiration, and temperature became practically normal. (Chart II.)

On March 7th he weighed 112¾ pounds, his normal weight being about 150 pounds. On the 22d of that month his weight was 122 pounds, and on April 11th 127 pounds; but although the general improvement was marked the suppurative process was not arrested.

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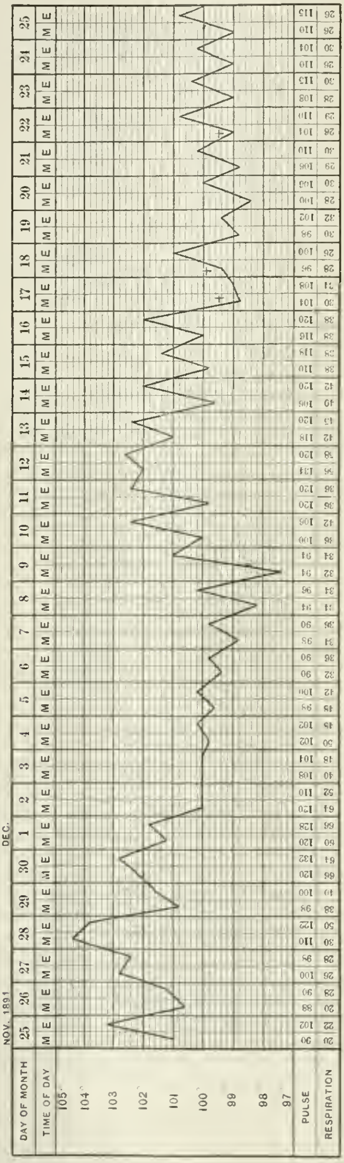
[1] The needle having an eye one-third of an inch from the tip, it was impossible to determine, by noting the depth at which pus began to flow, the thickness of the intervening tissues if under half an inch.

On March 13th 6½ ounces of pus were aspirated from the abscess, and 6 to 6½ ounces on each of the three following days. These aspirations did

CHART I.

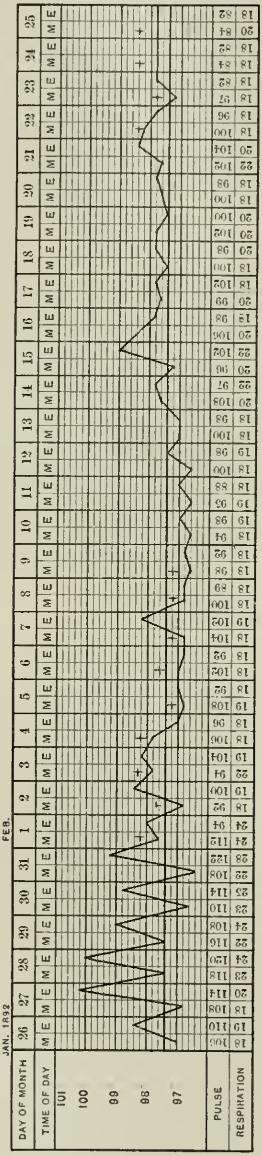


The first month.

December 17. Aspiration . . . . . . . 23 ounces pus.
" 18. " . . . . . . . 25 " "
" 22. Pleurotomy.

not empty the sac, but the patient now seemed unable to tolerate the withdrawal of large amounts, and the use of the aspirator was henceforth discontinued. During the following month the temperature at no time exceeded 99°, the pulse and respirations were normal, and the patient continued to gain in strength. During the night of April 25th

CHART II.



The second and part of the third series of aspirations.

Second series.

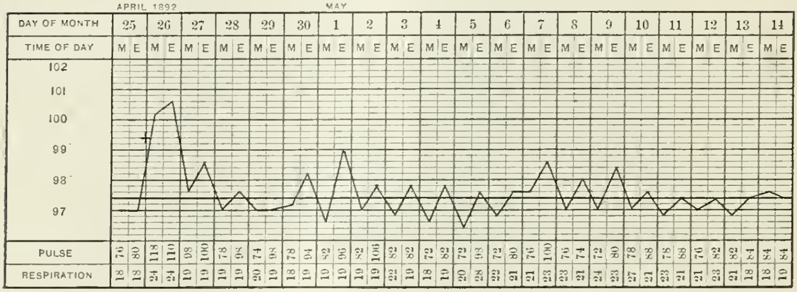
February 1. Aspiration . . . . . . 12 ounces.
" 2. " . . . . . . 15 "
" 3. " . . . . . . 14 "
" 4. " . . . . . . 14½ "
" 5. " . . . . . . 14 "
" 6. " . . . . . . 13 "
" 7. " . . . . . . 16 "
" 8. " . . . . . . 13½ "
" 9. " . . . . . . 2½ "
114½ ounces.

Third series.

February 22. Aspiration . . . . 15 ounces pus.
" 23. " . . . . 15 " "
" 24. " . . . . 12 " "
" 25. " . . . . 4½ " "
46½ ounces.

the abscess burst into a bronchial tube. There was a profuse purulent expectoration, some rise in temperature, and an increase in the rapidity of the pulse and of the respiration. The well-marked dulness which had been present over the left lower lobe in the back and the axilla still continued. (Chart III.) Loud moist râles were heard over the back, but definite signs of a cavity were not detected. The slight broncho-pneumonia caused by the rupture led to greater oscillations of temperature during the month of May, and the cough was annoying; but on the whole there was a steady gain. In June the temperature was normal, the expectoration had become insignificant, and the patient was nearly well. On June 22d he was dismissed from the hospital and put upon light duty, and soon afterward was dropped from the sick-report as cured. His term of enlistment expiring in the autumn of that year, he passed successfully the physical examination for re-enlistment, the only defect observed being a slight loss of expansibility of the left side of the chest.

CHART 3.



Rupture of the abscess.

+ Abscess ruptured into bronchus during the night.

CASE II.—The patient, a large and powerful man, about thirty-five years of age, was seen in consultation with Dr. J. H. Lott, of Buffalo, Wyoming, in February, 1892. He had been ill with pneumonia of the lower lobe of the left lung for several days, and shortly before my visit a consolidation of the lower lobe of the right lung had also manifested itself. He recovered from the double pneumonia, but did not regain his strength. He was seen again in consultation with Dr. Lott on April 22, 1892. At that time he was weak and emaciated, suffered from an obstinate cough with mucous expectoration, and from fever and sweats. On physical examination the right lung was found to be normal, except that the breath-sounds were somewhat exaggerated. On the left side of the chest the respiration was somewhat harsh. Percussion showed marked dulness, almost flatness, over an area below the left scapula about the size of the palm of the hand, at which point there was also a diminished transmission of breath-sounds, voice, and fremitus. The patient's symptoms pointing clearly to the presence of pus, an exploratory aspiration was made on April 25th at a point an inch below the angle of the left scapula in the centre of the region of dulness. Pus was encountered at the depth of about an inch, and 16 ounces were withdrawn. The aspirations were repeated on April 28th, May 2d, 4th, and 7th, the amounts removed at each operation ranging between 12 and 16 ounces. It was supposed that it would be necessary to continue the aspirations, but the patient improved so rapidly in health that I was not called in again.

In about three weeks after the last aspiration the patient's attending physician informed me that the abscess had ruptured into the bronchi. After this event convalescence was rapid and uneventful, and the patient soon regained his former robust health.

As has been already remarked, writers differ greatly as to the frequency of pulmonary abscess. Leyden,[1] for example, is of the opinion that it occurs more frequently in private practice than is commonly supposed.

Sée[2] says that it is an affection so rare that the thought of it need hardly embarrass the clinician in the diagnosis of other conditions, and will concede that a case is one of pulmonary abscess only when the autopsy shows a collection of pus in a focus of gray hepatization.

Laennec[3] states that abscess follows pneumonia with varying frequency, and says that in the year 1823 he met with more than twenty cases of abscess following pneumonia, in two of which the diagnosis was confirmed by autopsy, while the remainder, some of which were evidently of considerable extent, recovered completely within a period of fifteen to forty days, a statement which has been received with much skepticism by Laennec's editors and other subsequent writers. Their difficulty appears to be to reconcile such favorable results with the presence of lesions at all comparable with those found in fatal cases of abscess; but they might well be challenged to name the disease which, presenting the signs of a pulmonary cavity and being attended presumably by profuse purulent expectoration, could terminate in quick recovery. If with Sée we say that it was localized empyema, we simply solve one difficulty by creating another, for such rapidity of cure without operation in a series of empyemata is certainly unprecedented. These critics commit the error of assuming that there is but one kind of pulmonary abscess. The objections to the diagnosis of pulmonary abscess in cases which recover, so far as they are based upon the supposition that an extensive loss of lung-substance is the inevitable result of the formation of an abscess, lose their force if we shall succeed in demonstrating that a large abscess may exist within the lung without causing any considerable destruction of the pulmonary vesicles and under conditions which are as favorable for complete cure as can occur in empyema.

Every collection of pus within the lung is a pulmonary abscess in the widest sense of the term. Excluding the usually small and multiple abscesses of general infectious disease, we will consider only that class of abscesses, of relatively large size and generally single, in which the local suppuration within the pulmonary tissue constitutes the chief or only morbid condition present. Abscesses of the lung are divided clinically into two kinds: the open or discharging abscess, and the closed abscess.

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[1] Volkmann's Sammlung kl. Vorträge, Nos. 114 and 115.

[2] Diseases of the Lungs, pp. 110, 302.

[3] Traité de l'Auscultation Médiate.

The open abscess is in communication from the first, or from a very early period, with the bronchi. The closed abscess has no communication with the bronchi for a period of weeks or even months, until it finally ruptures with a profuse discharge of pus. The open abscess occurs as a sequel of pneumonia, gangrene, bronchiectatic ulceration, and bronchopneumonia from the aspiration of infectious matters. It most frequently follows pneumonia. Leyden thinks that abscess is not a direct sequel of pneumonia, but is preceded by gangrene; the view which was formerly held, and which is still taught, that the post-pneumonic abscess is the result of a purulent infiltration and subsequent diffluence of the pulmonary cells, being, in his opinion, less probably correct. Ziegler recognizes suppuration as a rare issue of pneumonia, but says that large abscesses are extremely rare, and are probably formed only when some previous morbid alteration, sometimes patches of necrosis, has already existed. If these views be accepted, gangrene must be regarded as by far the most common cause of the open abscess. The two diseases shade into each other, the so-called abscess generally representing merely cases of gangrene in which the amount of necrosed tissue is relatively small. English writers call all abscesses of the lungs not due to tubercle or bronchiectasis gangrenous abscesses.[1]

The pus of these abscesses is in contact with the air through the open bronchi. It rapidly undergoes putrefactive changes and acquires, if it has not from the first possessed, corrosive properties. The abscess extends by ulceration and destruction of the contiguous lung-tissues. A fetid, sometimes thick and scanty, sometimes abundant and frothy, sputum is generally the first evidence of the existence of such an abscess. This expectoration, of course, does not necessarily appear at the beginning of the illness, but there is no extensive accumulation of pus previous to discharge. Since the open abscess is generally secondary to gangrene, the living air-cells undergoing destructive purulent inflammation only when the infection is primarily virulent or has become so because of the pabulum afforded to septic organisms by dead tissue or stagnant fluids, it is evident that the seat of true abscess of the lung must be sought elsewhere than in the air-cells.

Fischl[2] defines a genuine pulmonary abscess to be "an acute or subacute abscess which, not being preceded by other disease of the lungs, forms in the interalveolar connective tissue precisely as suppurative inflammations develop in the connective tissue of other organs," a definition which would be improved by the omission of the clause which excludes antecedent disease of the lungs, for this abscess, except when due to septic embolism, is probably always preceded by some form of pulmonary inflammation.

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[1] Godlee: Lancet, 1887, vol. i. p. 457.

[2] Wien. med. Presse, vol. xxvii. p. 1585.

Stokes's[1] case is the first one on record of unmistakable abscess of the pulmonary connective tissue, and his description is still unsurpassed as a picture of the fully developed disease. In this case, in which the abscess followed acute pneumonia, "the lower lobe was a bag of matter, the yellow color of which was seen plainly through the pulmonary pleura. This being opened displayed the substance of the lower lobe completely dissected from its pleura by the suppurative inflammation of the subserous cellular membrane. This process was also found to have invaded extensively the interlobular and intervesicular cellular tissue, so as to cause this part of the lung to represent nearly the structure of a bunch of grapes. All these nearly isolated lobulės were surrounded by puriform matter, in which they hung from their bronchial pedicles. There was no air in the cavity thus formed within the pleura yet external to the lung, nor could I find any evidence of any bronchus communicating with it." Under the name of dissecting-pneumonia the disease has been described by many authors. Rindfleisch[2] thus defines it: "Dissecting-pneumonia is a suppurative inflammation or a purulent destruction of the partitions of connective tissue which unite the principal lobular divisions of the lung. When the suppuration has destroyed these partitions the pulmonary lobules are necessarily separated into smaller segments, whence comes the name of the disease. It is easily determined by simple inspection that the inflammation is propagated by way of the lymphatics, which, starting from the surface of the pleura, pass to the root of the lung through these partitions of connective tissue. These vessels, filled with and surrounded by pus, are seen to form varicose cords of a yellowish-white which traverse the walls of the already separated pulmonary lobules. The lobules may be more or less dissected, but generally death occurs so quickly that the separation is only partially effected or is even only indicated."

Hutinel and Proust[3] describe, in addition to the subpleural form already mentioned, a dissecting-peribronchitis which originates as a peribronchial lymphangitis and extends peripherally. In these abscesses there is extensive destruction of air-cells, and the denuded bronchi and bloodvessels hang free in the abscess-cavity. The peribronchial abscess appears to rupture at an earlier period than the subpleural variety. In one of Hutinel and Proust's cases rupture took place on the nineteenth and death on the twenty-fourth day. In another rupture occurred on the fourteenth and death on the twenty-second day. Ziegler,[4] treating of the subpleural lymphangitis, says that "the inflammation may spread from the interlobular to affect the peribronchial lymphatics. The lobules may also become inflamed, so that the already compressed lung-tissue becomes the seat of inflammatory exudation and infiltration, and the appearance of the lung is like that of an ox dead of pleuro-pneumonia. If the disease is not fatal, recovery takes place by resorption. Should residues of inspissated pus remain in the thickened septa, nodules having much resemblance to gummata are formed."

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[1] Diseases of the Chest, New Sydenham Society, 1882, pp. 124, 125.

[2] Lehrbuch der Path. Gewebelehre.

[3] Etude sur la Pneumonie Disséquante. Archives gén. de Méd., 1882, p. 532.

[4] Text-book of Pathological Anatomy, Am. ed., vol. iii. p. 156.

The subpleural abscess, with which we are especially concerned, is described by the authors above quoted as a complication of empyema. Indeed, Ziegler's name for the disease is pleurogenous pneumonia. Subpleural lymphangitis may, however, occur independently of suppuration of the pleural cavity. Recent bacteriological investigations have shown that micro-organisms are found in the lung-structures, the lymph-spaces of the pleura, and upon the pleura itself when the lungs are the seat of bronchitis, broncho-pneumonia, and lobar pneumonia;[1] that pulmonary inflammation is always accompanied by micro-organisms, and may be regarded as directly dependent upon their action; that several species of bacteria may be found in the lung at the same time, all concerned in the inflammatory process; and that solution of continuity in the mucous membrane of the respiratory tract is a necessary antecedent to infection.[2] The non-pleurogenous subpleural abscess may, therefore, be regarded as due to infection of the subpleural lymphatics by micro-organisms which reach these vessels by the way of the inflamed air-passages. The affection generally follows pneumonia, probably as the result of a mixed infection. Subpleural lymphangitis doubtless leads more commonly to a pleuritis. In cases in which the pleural cavity is not directly affected we may argue a less severe form of infection. The prognosis of the subpleural abscess is, of course, better in cases in which a complicating empyema is absent, which may account for the fact that in its uncomplicated form the disease is so rarely found at autopsies.

The pathology and pathological anatomy of dissecting-pneumonia are thus pretty well established; but on the clinical aspect all is uncertainty. Hutinel and Proust, raising the question whether such abscesses are susceptible of cure, are unable to answer it further than to say that cases have been reported which present the closest analogies to those which they themselves have seen, and which have terminated in complete recovery. They add that it doubtless will be long before it can be proved that such cases are curable, because of the difficulty of affirming their existence during life. Ziegler, as we have seen, recognized two terminations of subpleural lymphangitis—death and cure by resorption; but if there is not a third termination of the developed abscess, viz., by ulceration and rupture, these abscesses must differ in an inexplicable way from other abscesses of the connective tissue. In the closed abscess the delay in the expectoration and the nature of the pus discharged would seem to be proofs that the pus has collected in a location where it has been from the first completely excluded from the air—*i. e.*, in all probability in the connective tissue.

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[1] Koplik: Am. Text-book Diseases of Children, p. 910.

[2] Herrick: Supplement. Ref. Handbook of the Medical Sciences, p. 576.

Both Leyden and Hutinel and Proust express the opinion that suppuration of the pulmonary connective tissue is the cause of the majority of cases of pulmonary abscess; but facts have been wanting which should positively connect the pathological findings in fatal cases of dissecting-pneumonia with the clinical course of closed abscesses which end in recovery. Since so far as I have been able to learn, my first case is the only case of subpleural abscess in which the diagnosis has been made during life, it is of sufficient importance to warrant a brief discussion of its more significant features and of the reasons for that diagnosis, by which it is hoped that some light may be thrown upon the nature of closed abscesses of the lung in general.

Referring to the record, we notice that the temperature during the first seven days of illness, while not typical of croupous pneumonia, is certainly not incompatible with that diagnosis. The physical signs and the clinical course of the disease in my opinion fully warranted the diagnosis of acute croupous pneumonia of a somewhat adynamic type. A second period, marked by a remission of the fever and a temporary improvement in the pulse and respiration, is succeeded by a third period, in which the increasing oscillations of temperature are suggestive of suppuration; but the continued high pulse- and respiration-rates after the first fall in temperature make it seem probable that the disease originated primarily from a mixed infection, and that the suppurative process was well under way before the pneumonia began to resolve. In two aspirations, on December 17th and 18th, 48 ounces of pus were withdrawn. The second series of aspirations, from February 1st to 9th inclusive, removed 114½ ounces. In a third series of aspirations, February 22d to 25th, 46½ ounces were removed. Continuing the aspirations for four days longer, 3 ounces of a cloudy serum were obtained at each operation. The fact that serum took the place of the pus leads to the following conclusions: The third series of aspirations emptied the sac; the second series having been made at the same point, must also have emptied the sac; the abscess having refilled with serum, not pus, the daily secretion of pus at that time was less than three ounces. Making due allowance, therefore, for the secretion of pus during the time occupied by the second series, we infer that the actual capacity of the abscess was a little more than 90 ounces.

Ascent of the diaphragm and expansion of the right lung may be assumed to have borne a part, although doubtless a relatively insignificant one, in filling the vacuum left by the evacuation of the pus; but a very considerable proportion of the space occupied by this enormous abscess must certainly have been filled by the expansion of the left lung. Bearing in mind the fact that unduly rapid aspiration of pleural exudates is followed by grave circulatory disturbances, although in this case the lung is simply re-expanding to its normal size, we may infer that the patient could not have tolerated the aspirations if they had induced an extensive and acute overdistention of the neighboring healthy lung, and that therefore the vacuum must have been filled in great part by a re-expansion of collapsed lobules. As a matter of fact, the aspirations were well borne and no alarming symptoms were ever produced by them; but the patient complained more of a vague discomfort and of a sensation of stretching during those aspirations which completely emptied the abscess than during the earlier use of the aspirator. The fact that three ounces of serum were invariably found present after the abscess had been emptied of pus shows that there was a small portion of the original abscess-cavity, representing probably the amount of lung-tissue destroyed by the suppurative process, which could not be refilled by the normal re-expansion of the lung. When this space was emptied the abscess-walls were collapsed by atmospheric pressure, but at the expense of an overdistention of the neighboring lung with air and blood. The *hyperæmia ex vacuo* led to the effusion of sufficient serum to restore the balance of atmospheric pressure. The aspirations thus afford us a means of estimating in a rough way the ratio which the processes of destruction and of collapse of lung-tissue bore to one another in the formation of the abscess-cavity, and show that collapse was by far the more important.

If, in accordance with the prevalent teachings, we suppose this abscess to have originated in a suppuration of the pulmonary air-cells, there are two hypotheses which may be advanced to explain its growth. First, that the space for the abscess was gained chiefly by destruction of the affected tissues. This hypothesis is negatived by the results of the aspirations already discussed, and also by the termination of the case. The patient could not have recovered as perfectly as he did if a large part of the left lung had been destroyed. The second hypothesis is that the abscess began as a localized process, and grew chiefly by compression of the surrounding lung. A localized collection of fluid, if it increases very slowly, may be supposed to cause a consolidation and a pressure-atrophy of the immediately surrounding lung, the tissues thus accommodating themselves to the gradual increase in the size of the sac, so that the tension of its contents, while probably always positive, is not great; but if the accumulation of fluid is rapid in its increase, the elastic resistance of the pulmonary tissues must necessarily create a considerable tension within the sac. This process is illustrated in hydatid cysts of the lungs, in which it is found that the contents of the young cysts are under sufficient pressure to escape freely through a small trocar without the need of aspiration.[1] In so large an abscess and one which at first grew so rapidly as the one now under consideration, if it originated as a local process and gained space for itself by compression rather than destruction of the surrounding lung, the tension must have been very great; but it needs no argument to prove that high tension could not have characterized an abscess which existed for months without rupture, and of which one wall was formed by the pulmonary pleura. The vitality of the pleura is remarkable under any hypothesis; but it would seem impossible that so delicate a membrane isolated, or nearly isolated, from other living tissues, and bathed with pus over so great an extent of surface, could escape necrosis if it were subjected at an early period to any considerable tension. And in this case, as it happens, we cannot escape from this conclusion by the assumption that the pulmonary was supported and nourished by means of adhesions to the thoracic pleura, at least in the early stages of the abscess; for it will be remembered that forty-eight ounces of pus—a larger amount than Trousseau thought a pulmonary abscess could contain—were withdrawn on December 17 and 18, 1891, leaving a considerable amount of pus within the abscess-cavity, and that the operation on December 22d demonstrated that no adhesions were at that time present. If we suppose the abscess to have originated within the air-cells, in addition to the difficulty of explaining the absence of high tension or of extensive destruction of the lung, there is the equally great difficulty of accounting for the fact that the abscess remained closed for so long a time. It is doubtless true that the smaller bronchi are often occluded by inflammatory processes or by an inspissated secretion; but it appears highly improbable that all the bronchi communicating with the large affected area could be so firmly closed as to be absolutely impervious for weeks to quarts of a thin and homogeneous pus.

The only way in which, with due regard to all the facts, we can conceive of the development of the abscess to such large dimensions is by supposing it to have been a subpleural abscess, the result of a dissecting-pneumonia. In this disease, the connective tissue being first dissolved by the suppuration, the pulmonary lobules are left free in the cavity of the abscess, and retract by virtue of their elasticity as the pus collects. *The same process occurs in each isolated lobule which takes place in the lung as a whole in the presence of a pleural effusion.* Pus can, therefore, accumulate without producing positive tension until the space which the suppurative process thus provides for itself is exhausted—*i. e.*, until the destruction of the connective tissue has ceased and the abscess has become limited. Positive tension, then, is a late phenomenon in these abscesses as it is in pleural effusions.

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[1] Dungan Bird, quoted by Sée: Diseases of Lungs, p. 304.

All large closed pulmonary abscesses which terminate favorably are probably subpleural abscesses; for the theory that the abscess occupies space gained by collapse rather than destruction of pulmonary lobules is the only one which can reconcile the two apparently contradictory facts: First, the presence of a large amount of pus; second, a recovery so complete as to prove that no great destruction of pulmonary tissue could have occurred.

It is instructive to contrast my first case as an example of subpleural abscess with the cases of dissecting-peribronchitis described by Hutinel and Proust. In these cases the suppuration began around the bronchi and extended peripherally through the lobules. The abscesses must have been under a positive tension from the first. The destruction of tissue was great, and rupture took place at an early period. The prognosis of a large abscess can only be good when it develops beneath the pleura, so that the destructive effects upon the pulmonary tissues of pus confined within them under a positive tension are avoided.

The diagnosis of pulmonary abscess, according to Juergensen,[1] can be made only when the abscess has burst and left a large cavity, filled with air, communicating with a bronchus and situated near the surface; but in the large superficial abscess, with which we are especially concerned, the presence of pus before rupture is easily ascertained by exploratory puncture, and the determination of its location with respect to the pulmonary pleura is the important question. The diagnosis by means of physical signs between encysted empyema and subpleural pulmonary abscess is impossible both before and after rupture, for the intervention of a thin membrane like the pulmonary pleura between the abscess and the chest-wall cannot change the percussion-note nor the auscultatory phenomena. Change in the location of the dulness with the varying position of the patient, if detected, does not exclude abscess. Holt[2] reports a case of closed pulmonary abscess simulating empyema, in which the line of flatness changed with the patient's position.

Fenger and Hollister[3] give the history of a case of abscess caused by suppuration of a hydatid cyst, in which the percussion-note of the anterior chest was dull when the patient was erect, but became tympanitic when he lay upon his back.

When the abscess has discharged by rupture into the bronchi we may have signs from a pulmonary cavity which are not distinguishable from those of pyopneumothorax. Metallic sounds on percussion and the succussion-sounds may be found in large pulmonary cavities.[4] The "cracked-pot" sound is sometimes heard in pyopneumothorax.[5] Nor are the symptoms more distinctive. For example, the most striking symptom in the early course of my first case was the terrible paroxysms of coughing produced when the patient attempted to turn upon his side; but Fraentzel[1] remarks that cough brought on by every change of position is one of the characteristic symptoms of large effusions into the pleura, and frequently induces the experienced physician to suspect with probability the existence of such an effusion even before he has made a physical examination.

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[1] Ziemssen's Cyclopædia, vol. v. p. 126.

[2] New York Medical Record, April 16, 1887.

[3] AMERICAN JOURNAL OF THE MEDICAL SCIENCES, October, 1881, p. 378.

[4] Fraentzel: Ziemssen's Cyclopædia, vol. iv. pp. 763, 764.

[5] Ibid., p. 761.

Trousseau[2] says that the time at which the abscess ruptures is the most important point in the differential diagnosis of pulmonary abscess from empyema; that it is impossible for a pulmonary vomica to pass the twentieth to the twenty-fifth day without opening into the bronchi; whereas a pleural abscess breaks through the lung not earlier than the fortieth day. He also remarks that the quantity of pus evacuated is significant; that an abscess of the lung cannot contain more than a litre, while the pleural abscess may contain two, three, or even four litres. The history of my first case, in which the abscess contained about three litres of pus and in which a period of forty-four days (December 18, 1891, to February 1, 1892) intervened between the first and second series of aspirations, and forty days again between the last aspiration and the rupture, shows well the futility of attempting to fix arbitrary limits of space and time for these abscesses.

The presence of elastic fibres of lung-tissue in the expectoration, as determined by microscopic examination, is an evidence of destructive suppuration of the lung. The fibres are very numerous in the pus from pulmonary abscesses; but since the process of perforation from the pleural cavity into the bronchi is necessarily attended by more or less inflammation and destruction of the lung-tissue, these fibres might also be detected in the pus expectorated from an empyema. A probable diagnosis could, however, be made between the two affections from the relative number of fibres present.

But it is especially desirable to distinguish subpleural abscess from empyema before rupture, not only for the purposes of treatment, but also to avoid the blunder of performing an unnecessary or premature pleurotomy upon such an abscess under the supposition that it is an empyema. Here a positive diagnosis may be reached, it is thought, by the microscopic examination of the *aspirated* pus, for in the commoner form of empyema due to infection of the pleural cavity by way of the lymphatics the lung-tissues previous to rupture are intact, and elastic fibres are, of course, absent from the pus, whereas they are probably abundant in the pus of the subpleural abscess. The only cases in which doubt could arise are the rare forms of empyema caused by the rupture of simple tuberculous or gangrenous abscesses of the lungs into the pleural cavity, in which the presence of elastic fibres in the pus is possible. Here, too, a probable diagnosis could be established from the relative number of fibres present, as well as from the history of the case.

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[1] Ziemssen's Cyclopædia, vol. iv. p. 633.

[2] Quoted by Leyden, op. cit.

Encysted empyema is limited by adhesions which are either true cicatricial adhesions from previous disease, or, if due to the inflammation which causes the pus, in the early stages of the abscess amount simply to an agglutination of the opposed pleural surfaces by the effused fibrin. Such adhesions must be too weak to resist any considerable tension; but in encysted empyema the adhesions necessarily prevent in great measure the retraction which occurs in a general pleuritis as the result of effusion. Hence, if pus is abundantly formed, the tension of the abscess must quickly become positive. If then in a supposed localized empyema early aspiration shows the quantity of pus present to be relatively great, the area of dulness being distinctly limited, especially if, as in my second case, the limit of the lateral extension can be plainly made out,—if we adhere to the diagnosis of empyema, we can only account for the failure of the pus to burst through its barriers and produce a general empyema by the rather improbable assumption that lines of impervious cicatricial adhesions enclosing a portion of non-adherent pleura were present before the abscess developed. If such an abscess terminates in rapid recovery after a free rupture into the bronchi, the favorable issue tends to establish more positively the diagnosis of pulmonary abscess rather than of empyema. For the prognosis of empyema after rupture into the lung is only good, according to Traube and Fraentzel,[1] in case the pus is discharged slowly under the pressure of cough through the meshes of the alveolar tissue in such a way that the production of pyopneumothorax is prevented. The question as to the prognosis of empyema, and especially of encysted empyema, requires further investigation, for it is probable that the confusion of cases of subpleural abscess with empyema has caused the prognosis of the latter disease to be regarded as more favorable than it really is. If we admit the possibility of the individual retraction and expansion of lobules in subpleural abscess, there is, at all events, no necessity of resorting to the diagnosis of empyema in order to account for the fact of cure of an intrathoracic abscess. On the contrary, it is evident that the advantage with respect to expansibility of the lung is likely to lie upon the side of the subpleural abscess. It unfortunately did not occur to me to examine microscopically the aspirated pus in my second case; but for the reasons above presented it appears to me that it should be regarded as a subpleural abscess rather than an encysted empyema.

If the patient attacked by a dissecting-pneumonia survives until a subpleural abscess has developed, the chief dangers which threaten him are: death from exhaustion and sepsis previous to rupture; death from suffocation during rupture or as a result of broncho-pneumonia due to the aspiration of pus into other parts of the lung; failure of the abscess-cavity to contract and heal, whether the result of insufficient opening, or more probably because of destruction of tissue and impermeability to air of the surrounding lung; rupture into the pleural cavity with the production of empyema. The corresponding indications for treatment are: first, to lessen septic absorption and improve the patient's health; second, to diminish the size of the abscess permanently; third, to re-expand the collapsed lobules; fourth, to favor rupture into the bronchi. It can, I think, be shown that repeated aspirations fulfil to a certain extent all these indications. Inspection of the temperature-chart of the first case shows clearly the benefit to the pulse, respiration, and temperature which was derived from the aspirations, especially those which completely emptied the abscess. And the ground thus gained was not all lost when the abscess refilled. The patient continued to improve in strength and gain in weight even at times, as in the month of April, when no aspirations were performed and the abscess was doubtless increasing in size. In the second case the improvement in the general condition of the patient after the aspirations was even more marked. The explanation of these clinical facts undoubtedly is that the removal of the pus stopped for the time the absorption of toxic substances, the patient's general health was thereby improved and his powers of resistance increased so that destructive ulceration was checked; the abscess-walls were thickened by the growth of inflammatory tissue, and their absorptivity became permanently diminished. With regard to the second indication, the rapidity with which the abscess of the first case was emptied or nearly emptied after rupture pointed to a free opening. The amount of pus expectorated was not measured; but there seemed no doubt that the quantity was much less than the ninety ounces which we suppose to have been at one time approximately the capacity of the abscess—an amount which, if suddenly discharged, would probably have suffocated the patient, or at best have caused a severe broncho-pneumonia. Permanent diminution in the size of the abscess is to be expected if it is emptied while granulation is actively progressing in its walls; for the pus being removed the collapsed lobules re-expand, obliterating the upward interlobular prolongations of the cavity, and, being in contact with each other, they readily reunite. In so far as they are firmly reconnected, their individual retractility is lost, and they cannot again collapse except under positive pressure. At the same time the secreting-surface of the abscess is greatly diminished. The third indication, the re-expansion of collapsed lobules, is necessarily met by aspiration, as we have seen. The importance of re-expanding these lobules before they have become fastened down, as it were, in their position of retraction by the formation of connective tissue during the processes of repair is evident. The fourth indication, to favor rupture into the bronchi, can be met only indirectly by aspiration, in so far as that operation delays the time of rupture. When the abscess has become localized its walls are gradually strengthened and stiffened by the development of fibrous tissue. A continuance of the process by which space was provided during the first stage—*i. e.,* isolation and collapse of pulmonary lobules—is no longer possible, and increase in the contents of the abscess causes a heightened tension. The bronchial tubes which lie within the cavity and have been stripped of their connective tissue and bathed in pus undergo a process of inflammatory softening; but the processes of repair being much slower and more imperfect in cartilage than in more vascular tissues, whereas the other structures which constitute the walls of the abscess are becoming fortified by newly formed fibrous tissue to withstand the period of increased tension, the cartilaginous plates of the bronchial tubes are left relatively weak. The longer the duration of the closed stage of the abscess the more probable it is, therefore, that rupture will ultimately take place into the bronchi. This termination is favored by cough. For the lung being equably compressed during the expulsive effort with closed glottis, which constitutes the first stage of cough, when the glottis opens the pressure suddenly becomes negative in the bronchi, and the contents of the abscess are consequently strongly aspirated toward them. The changes of pressure from this cause are, of course, greater the larger the bronchus. It is probable, therefore, that the abscess will be evacuated at the most favorable point—*i. e.,* into the tube which will most directly discharge the pus. If the foregoing views are correct, aspiration, which, as a rule, in empyema, simply delays the more efficient operation by incision, is of much greater value in the treatment of the subpleural abscess. It is, perhaps, unnecessary to say that every care should invariably be taken to make the needle perfectly aseptic. Pleurotomy is not to be recommended in the treatment of the closed abscess, not only because the more favorable termination is probably by rupture into the bronchi, but also because the presence of adhesions is uncertain. Nothing is more difficult to determine than the presence or absence of adhesions in a given case. The greatest individual differences are observed, and the assumption which appears to be almost universally made, that adequate adhesions are necessarily present in superficial pulmonary suppurations, has led to the production of empyema and even to fatal results after the operation of pleurotomy. Thus Quincke[1] lost a case of pulmonary abscess, upon which he had operated, from empyema due to defective pleural adhesions.[1] When the abscess fails to cicatrize after rupture the indications for treatment become, of course, identical with those of the chronic discharging abscess.

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[1] Op. cit., pp. 619, 683.

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[1] Berlin. kl. Wochenschrift, 1887, No. 19.

The chief results of our inquiry may be summarized as follows:

1. Closed pulmonary abscesses are abscesses of the connective tissue, of which the most favorable and most common form is the subpleural abscess.
2. The subpleural abscess may attain a large size without causing a corresponding destruction of pulmonary tissue; for the individual pulmonary lobules, isolated by the suppurative process, retract before the pus in a manner analogous to the retraction of the lung as a whole in the presence of pleural effusion.
3. The frequency of the occurrence of subpleural abscess is probably greater than is commonly supposed; for this abscess simulates empyema so closely that it is generally mistaken for that disease.
4. The only trustworthy means of distinction between these two diseases is probably the microscopic examination of pus withdrawn by aspiration previous to rupture.

# HYDATIDS OF THE LIVER.

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The literature on this subject is very extensive from the eighteenth century on, and it is a noteworthy fact that more than 50 per cent. of all cases recorded occurred in the liver. Dr. Alexander Hugh Ferguson, of Winnipeg, has probably seen more cases of this kind than any other surgeon in America. Prof. William Osler, of Baltimore, in his late valuable work of 1894, claims to have gathered the literature of only 85 cases in the United States.

Etiology and Pathology. The parasite that causes this trouble is known as the tænia echinococcus. The mature tænia is a small tapeworm, one-quarter of an inch long, and inhabits the intestinal canal of dogs, jackals, and wolves. It has four segments, the last of which is as long as the other three combined. The head has a pointed beak, with a fringe of thirty to forty hooklets at its base, and four suckers. It has a vascular system running down each side of the body.

The ova of this worm are introduced into the alimentary canal with the food, but more commonly with the drinking-water. The embryo emerges from its shell and makes its way into the surrounding tissues, and may often be carried along in the blood-current as an embolus until it finds a resting-place in the lung, liver, kidney, thyroid gland, breast, heart, vermiform appendix, subperitoneal tissue, connective tissue of the trunk and limbs, the omentum, the medulla of the bones, spinal cord, or the brain. In the brain the cerebrum seems to be the most frequent seat of the cyst, the right lobe being affected oftener than the left. After reaching its destination it gradually develops into a hydatid cyst.

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[1] See also Godlee, Lancet, vol. i., 1887, p. 457, and Coupland, British Medical Journal, vol. ii., 1885, p. 427.

The scolices or heads are formed in brood-capsules. These scolices are directly continuous with each other by means of the parenchyma of the main and daughter-cysts. The walls of the hydatids consist of two layers, an outer cuticular or ectocyst or chitinous layer, and an inner or parenchymatous or endocyst layer. The cuticular layer is very elastic, and curls inward when divided. The parenchyma consists of granular matter, cells, and muscle-fibre.

The scolices are seen projecting from this parenchyma as small, wart-like bodies, and are frequently in groups of four or more attached to a common stem. They measure about 3 mm. in length and have four suckers and a fringe of hooklets, the same as the adults. These hooklets often become detached, and during a tapping of the cyst are withdrawn, and this forms the pathognomonic sign of hydatids. The fluid is non-albuminous, of low specific gravity, 1000 to 1010, and, as a rule, is clear, though at times it may be bile-stained.

The brood-capsules are developed from the parenchyma, and also have two layers, the outer one being the parenchymatous layer of the mother-cyst, and the inner one being the cuticular layer. It will be seen from this that the order of layers is reversed in the brood-capsules from that of the mother-cyst.

The daughter cysts may develop cysts of their own, and these are termed granddaughter-cysts or endogenous daughter cysts. Where this process takes place the mother-cyst, as a rule, is very large and may contain thousands of daughter-cysts. Some echinococci-cysts do not develop brood-capsules, and still attain great dimensions; these are termed sterile cysts.

The presence of the cyst irritates the surrounding structure and gives rise to the formation of a thick fibrous sheath or capsule, which at times is very vascular.

An interesting question in considering the pathology of this disease is, What becomes of the liver-tissue where large cysts develop in this organ? Some authors believe that an atrophy takes place, others are of the opinion that a hypertrophy take place; but it is my firm belief that the liver-tissue is never destroyed to any physiological extent unless there be an inflammatory exudate as a result of long-continued pressure in the liver, for if there was, how could it be possible to record such rapid improvement in these cases as is the general rule. I believe that by the slow growth of the cyst within the liver this organ gradually becomes compressed as a lung would be by pleural effusion.

If the cyst grows to a sufficient size, there will be interference with the physiological functions of the liver; but on tapping or opening these cysts the liver immediately expands and resumes its normal functions, as a lung does on being relieved of the presence of a pleural effusion. The thick connective-tissue capsule must also have some formation, and I believe it is formed from liver-tissue, due to the inflammatory exudate, as a result of pressure, forming a fibrous capsule, this capsule being the liver's protection.

The symptoms of hydatids of the liver vary, depending upon the size and location of the same. When sufficiently large and near to the surface they may be felt as globular tumors, of a firm and resisting tendency, and yet slightly elastic; in some cases fluctuation can be determined, according to the amount of fluid present.

The tumor may be situated behind the liver, and in cases of this kind, where it does not grow to a large size, may give rise to no external manifestations. In other cases, in which the tumor is situated posteriorly, as it grows it pushes the liver before it: hence there are a flattening and downward protrusion of this gland, with a corresponding increase of hepatic dulness.

As the cyst grows we have our attention called to pressure-symptoms. The patient may feel the tumor, or complain of a dragging sensation, or, as some explain it, as though there was a weight attached to the liver. There may be dyspnœa and a dry cough as a result of the upward growth of the cyst toward the diaphragm; we may also find an explanation for palpitation by the displacement of the heart by the tumor. The stomach may also be interfered with, and we have as a result vomiting, different gastric symptoms, and emaciation.

When the portal vein or vena cava is pressed upon we look for ascites, jaundice, and hemorrhoids. Absence of bile in the feces may be due to direct pressure of the hydatid upon the bile-ducts. An acute pleurisy may be due to rupture of a hydatid into the pleural cavity. Peritonitis results from the emptying of the cyst into the peritoneal cavity.

DIAGNOSIS. This is really difficult, if not impossible, in the early onset of the disease, as some patients retain good health for years, and even die at an advanced age from some other trouble, without being aware of the fact that they are subjects of this disorder. *This also shows that there can be little if any physiological destruction of the liver.*

DIFFERENTIAL DIAGNOSIS. It is sometimes possible to differentiate hydatids from cancer of the liver, abscess, enlarged gall-bladder, aneurism, pleurisy, and cysts of the right kidney.

In cancer of the liver we have an irregular surface and border, pain, rapid progress of the disease, and the well-marked cachectic appearance of the patient. In abscess of the liver there will be local pain, with a history of rigors, hectic fever, and very likely antecedent attacks of dysentery. It is well to mention here that hydatids sometimes suppurate, but the constitutional symptoms are not so severe as in abscess.

A hydatid cyst may frequently be mistaken for an enlarged gall-bladder, but the pyriform shape of this organ, with the history of biliary colic and jaundice, should be remembered in making a differential diagnosis.

An abdominal aneurism will pulsate and give the bruit along the course of the aorta. To differentiate hydatids from pleural effusion of the right lower chest, we observe the following points: In pleurisy the fluid will change with the change of position of the patient, and the liver is not necessarily enlarged, while in hydatids the fluid is stationary and the liver almost always enlarged.

In cysts of the right kidney we will obtain a history of the tumor starting below and growing upward, while the reverse holds good in hydatids of the liver. In the former we have tympanitic percussion due to the colon, while in the latter there is always dulness.

RESULTS OF HYDATIDS. Hydatids of the liver may cause no trouble whatever or they may result in the following:

1. By pressure interfering with the functions of some organs of the body, and by attaining a large size, causing ascites and dropsy.

2. Forming adhesions with the diaphragm and ulcerating through, either into the pleura, causing pleuritis, or further ulceration may take place in the lung, and the contents, coming originally from the liver, may by this channel be expectorated and lead to a spontaneous cure.

3. A fistulous opening may be formed into the lumen of the bowel and lead to a cure.

4. If they open into the stomach and the fluids and cysts be vomited, a cure is the result.

5. If a simple cyst ruptures into the kidney or bladder, a spontaneous cure is possible.

6. If they empty into the pericardium, the peritoneal cavity, bile-ducts, or gall-bladder, the result is disastrous.

7. Cases are on record in which hydatids have invaded the trachea and produced death by suffocation.

8. Nature's best cure, without any surgical aid, is the formation of adhesions to the parietes. Cases are on record which have emptied themselves externally, but this favorable result is not often met with.

9. Finally, a calcareous degeneration may take place within the cyst, and thus lead to a very satisfactory termination.

Case I.—Family history negative. Patient's history: female, aged thirty-two years; Russian; height, 5 feet7 inches; weight, 120 pounds. Was always in good health up to her twenty-fourth year, that is, eight years ago, when she noticed a hardness and fulness in the right hepatic region. Her bowels at this time were regular, appetite good, and she had no pain or fever. She continued in good health up to a year before the operation, when she complained of pain and had fever and loss of appetite. In the intervening seven years she noticed that the mass in the right side grew very slowly. She never was jaundiced and never was closely associated with dogs.

I saw the patient for the first time on October 3, 1893, at the St. Elizabeth Hospital, and after a careful examination advised operation, my diagnosis being cyst of the gall-bladder due to an inflammatory obstruction of the common duct.

On October 10th, with the assistance of Drs. Luken, Kunz, and Wittwer, a vertical incision was made over the most prominent portion of the mass to the cyst. There being no adhesion to the parietal peritoneum, the finger was introduced, and the tumor found to be adherent to the omentum, the intestines, and to the under surface of the liver. An aspirator was introduced into the cyst and the characteristic fluid withdrawn. I immediately knew that I was not dealing with a cyst of the gall-bladder. The fluid commenced to ooze out after the withdrawal of the needle. A sponge was placed over the puncture and several other sponges were packed around the mass, so as to close off the abdominal cavity. The patient was then turned on her right side and with a knife the sac was freely opened, and as the cyst-wall became more lax forceps were attached to the margins of the cyst and the sac pulled out and emptied. It was then irrigated, the sponges removed and thrown away. The peritoneum was then sewed around the cyst-wall by a continuous suture, and two inches of the sac were removed. A large-size rubber tube was introduced, besides gauze-packing. The wound was dressed and the patient put to bed. The wound was dressed daily. A week after the operation large quantities of bile began to discharge, and continued to do so for two weeks. It was about three months before the entire cyst-wall contracted down and the fistulous opening became closed. The cyst in this case was about the size of a small fœtal head. It grew from the under surface of the liver, and instead of protruding outward grew downward, and thus formed adhesions to the intestine and omentum. She had no rise of temperature at any time after the operation.

I saw the patient on November 10, 1894, at which time she was in good health, but complained of pain at the site of the operation, which is due to a ventral hernia, the patient having failed to follow instructions and wear a supporter, as she was told to do.

Case II.—Family history negative. Patient's history: male, aged twenty-eight years; German; married; height, 5 feet 5 inches; weight, 120 pounds. Always had dogs about him. Nothing worthy of mention occurred for twenty years; at this time he was taken ill suddenly, with a severe pain in the right side in the region of the gall-bladder. He was ill for four and a half weeks, but did not know what ailed him or what he was being treated for. For the following five years he had occasional attacks of pain in the right side, but aside from this was perfectly well, his appetite remaining good, bowels regular, and he slept well. Three years ago he was sick for four weeks with an attack of typhoid fever. Recovering from this, he was in good health up to September 1, 1894, when he was again taken with a pain in the right hepatic region. He had a chill, followed by a temperature of 103.5° F.; he rapidly became jaundiced, and his physician informed him that he had gall-stones. During the following two weeks he suffered much pain and vomited bile-colored material.

On September 25th I was called to see the case through the kindness of my friend, Dr. Landis, and found the following conditions: A not well-marked hardness was felt at the supposed lower border of the liver, in the region of the gall-bladder; percussion gave dulness to a limited painful area the size of a fifty-cent piece. The patient was jaundiced to saturation, had an anxious, pinched look, and was very much emaciated. He had a temperature of 103° F., and a small thready pulse of 120. Although the hardness seemed a trifle high to be situated in the gall-bladder, I also was led to believe that I was dealing with a case of biliary calculus.

The operation was performed the same afternoon. With my assistant, Dr. Kunz, and in the presence of Drs. Landis and Chapman, an oblique incision was made over the region of dulness, two inches below the costal cartilages, through the peritoneum. A tense, white surface was brought into view, and my first thought was of abscess of the liver. The gall-bladder was examined, and being found empty I next proceeded to a more minute examination of the whitened surface. Sweeping my finger around this plane I discovered that adhesions had slightly formed in two places. I next sewed the peritoneum around the liver-border of the shining mass, and thus completed what Nature would have finished in a short time had the patient lived long enough without surgical interference. I now had to deal with a circular surface about the size of a silver dollar closed off from the abdominal cavity. Sponges were packed around the edges and the aspirating-needle introduced. A clear fluid was withdrawn, and my diagnosis was changed to that of hydatid of the liver. The needle was withdrawn and gauze packed over the puncture, which in this case gave rise to no leakage. The wound was dressed in the ordinary manner and the patient put to bed. His temperature dropped to normal, and four days later, the adhesions having become firm, a large opening was made through the centre of the white mass and hundreds of cysts immediately popped out. The cyst-cavity was thoroughly irrigated with sterilized water and the inner surface gently curetted with a dull curette, the object being to loosen the daughter-cysts from their parenchymatous attachment. A large-sized rubber drainage-tube was introduced and the wound again dressed. Several days later bile was discharged in large quantities and continued to discharge for a week. The jaundice disappeared and the fistulous opening soon contracted.

The patient, November 19, 1894, feels perfectly well and is attending to his duties, which are those of a teamster. He has gained twenty-six pounds since the operation.

In regard to the treatment of hydatids of the liver little more need be said than that which I have already brought out in the treatment of my two cases. For general rules, I think the following will be found applicable in the majority of cases:

1. An incision over the most prominent portion of the presenting mass, be this high or low; or, if no tumor can be discovered, the area of hardening and increasing dulness should be our guide for incision.
2. Examine for adhesions: if they be complete, our work is simplified; if not, we must sew the peritoneum all around the mass so as to shut off the abdominal cavity.
3. Introduction of the aspirator. This needs no explanation; but it is well to bear in mind that we do not always obtain the characteristic fluid, as at times the fluid may be too consistent to enter the needle.
4. We must wait for three, four, or five days for adhesions to become firm, before opening the cyst.
5. When the cyst is opened a large opening should be made and the largest size rubber-drain introduced.
6. The dressings must be made under strict antiseptic precautions, as there is a possible danger of secondary infection.
7. The cyst-cavity should be washed out with sterilized water for the first week, after this with carbolic solution, iodine solution, peroxide of hydrogen, boric acid, creosote, or any of the antiseptic solutions.

The point on which there has been more diversity of opinion than any other is: Where there are no adhesions should the operation be made in one or two sittings? Most authors advise two operations, claiming that there is too much danger of allowing the hydatid fluid to enter into the peritoneal cavity, which would perhaps result fatally, or it might form a nucleus for another cyst.

With care an operation of this kind can be performed in one sitting, as my first case will show; but the best plan is, if time will permit, first to sew the peritoneum to the sac and wait four or five days for the adhesions to become firm, as was done in my second case.

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# PROGRESSIVE MUSCULAR DYSTROPHY,

## WITH SPECIAL REFERENCE TO IMPROVEMENT BY TREATMENT.

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Before proceeding to the report of my own case, a short review of recent contributions to the many mooted questions regarding progressive muscular dystrophies will not prove uninteresting to the reader.

As a result of this subject, which was carried on for many years by Duchenne, Aran, Charcot-Leyden, Friedreich, and Lichtheim, there were finally created two divisions of progressive muscular atrophy—a spinal form and a primary myopathic form, including the pseudo-hypertrophic cases. The acceptance of this view was especially due to the exhaustive and comprehensive articles which were published by Erb in 1883. Erb separated the juvenile form from the typical progressive muscular atrophy of the spinal form, and recognized the relationship of the former to Leyden's hereditary and the pseudo-hypertrophic forms. In 1891 he grouped these types under the heading of "Dystrophia Muscularis Progressiva." In 1884 he described this dystrophy as a muscle disease, which may show itself either with hypertrophy followed by atrophy, or primarily with atrophy, with hyperplasia of the interstitial connective tissue, and which in the end regularly terminates in a greater or less lipomatosis. Whether the changes in the muscles or connective tissue, or in both at the same time, are the primary causes could not be determined.

The peripheral nerves and the cord did not show any visible changes. It is a chronic, slowly progressive disease, in which atrophy, hypertrophy, or pseudo-hypertrophy may be present at different periods. Whatever type the dystrophy may assume, the disease is characterized by an affection of the same muscles, by absence of fibrillary twitchings, and absence of the reaction of degeneration. It may begin and be especially marked in the upper or lower portions of the body, according to the age of the individual. Erb gives the following reasons for classifying all these forms under one head :

1. The constant occurrence of the same characteristic features in a large mass of clinical material.
2. The appearance of transitional forms.
3. The occurrence of different forms in the same family.

The juvenile form he describes as occurring in youth and middle age. There is an early affection of the muscles around the shoulders and upper arm and a limitation of the hypertrophy and pseudo-hypertrophy to individual muscles.

Pseudo-hypertrophy occurs in earliest childhood, especially in males; attacks the pelvis, lumbar-, thigh-, and calve-muscles. The hypertrophy is extended over a large area. Atrophy is present, especially in the upper extremities. The infantile form is characterized by the primary affection of the face.

The same pathological findings are present in all. Hypertrophy and atrophy of the muscular fibres, infiltration of round-cells, vacuoles in the muscles, splitting and division in the muscle-fibres, hyperplasia and round-cell infiltration in the connective tissue, increase in deposit of fat-cells to the highest degree of lipomatosis. The nerve-fibres and the cells in the anterior gray horns in the majority of cases are unchanged. Positive findings, as in the case of Heubner, are seldom.

Erb does not wish to say positively that the dystrophies are of primary myopathic origin. The constant occurrence of nervous disturbances and the constant localization of the process to the same class of muscles speak very strongly for the central origin of the disease.

This monograph was the incentive to the appearance of a large amount of literature upon this subject, which was justly classified as Erb had advised, and much also in opposition to his classification and views.

In 1886 Charcot and Marie described a third new form of progressive muscular atrophy which differed from the muscular atrophies, and was also distinct from the spinal atrophies. By Tooth, Sachs, and Herringham this type was described as the peroneal or leg type of progressive muscular atrophy. Hoffman gave it the name of progressive neurotic musuclar atrophy. According to Charcot and Marie, this form begins in the leg and foot; the small muscles of the foot are first affected, then the peronei, calves, thigh-muscles, and the muscles of the upper extremities, the muscles of the upper arm, head, and back remaining free. There are present fibrillary twitchings and the reaction of degeneration. The disease usually begins in childhood. Sachs and Herringham called especial attention to the hereditary taint which existed in these cases. Hoffman cited two cases, one an autopsy by Virchow and the other by Friedreich; both showed a degenerative atrophy in the muscles and peripheral nerves due to changes in the cells of the anterior gray horns.

Since this publication of Erb's the study has steadily gone on, and Hoffman has published cases of neurotic muscular atrophy in which he found histologically hypertrophied fibres. Hoppe described two cases of the facio-scapulo-humeral type with reaction of degeneration, and tried to establish its connection with the spinal form of progressive muscular atrophy. Strümpell relates a case which is analogous to that of Heubner and Frohmaier. Hereditary influences were present. Atrophy began in the small muscles of the hand; there were no fibrillary twitchings and no reaction of degeneration. Histological examination showed the peripheral nerves and the cells as atrophied, also the muscles were found atrophied, and some partly hypertrophied; some increased in volume, some splitting, and some vacuoles. He came to the conclusion that the atrophy began in the muscles and ascended in the nerves, eventually involving the cells in the anterior gray horns. Lewin, in his pathological and anatomical studies upon this subject, believes that progressive muscular atrophy is due to a diffuse process at work upon all the muscles, and that the cell-infiltration is one of the earliest expressions of the disease; that some irritating influence upon the muscle causes an increase of the muscle-nuclei and the connective-tissue round-cells. This in turn causes the disappearance of the muscle, by actually destroying it and using up the nourishment intended for this part of the human anatomy, and thus indirectly causing its disappearance.

Such is the literature upon this subject up to the present time. First considered as an individual disease due to a lesion in the anterior gray horns, then a division is made into spinal, myopathic, and neurotic forms. The tendency now is to bring the myopathic, the neurotic, and the spinal forms, after more advanced clinical and anatomical studies and general pathological considerations, under one head; the cause to be due to the disturbance of the trophic neuron of the motor apparatus. In a case lately contributed by Marinesco, of the Hoffman neurotic type, in which there were well-marked sensory disturbances, the autopsy showed degenerative changes in the peripheral nerves, with marked increase in the connective tissue and degeneration of the posterior roots; in the cord, sclerosis of the posterior columns; also sclerosis of Lissauer's tract; atrophy of the ganglionic cells and fibres in the anterior and posterior gray horns. Marinesco believes this so-called neurotic type to be a disease of the direct motor and sensory neurons, and considers that there is an hereditary predisposition to this particular affection.

The patient considered in this paper is clearly an example of a progressive muscular dystrophy:

This patient, F. Y., was presented before the New York Neurological Society two years ago. The history given at that time presented the following conditions: He was twenty years of age, and had been perfectly healthy up to May, 1892. He had not experienced the slightest difficulty in performing any muscular movement previous to that time, nor did he show any real or apparent decrease or increase in his weight. The first indication he had that there was anything the matter with him was in the latter part of May, 1892. He began to suffer from vague pains in the region of the spleen and liver. These pains would only trouble him whenever he would walk any great distance or exert himself to any great degree, otherwise when at home and at rest the pains were not marked enough even to attract his attention. Shortly after this he noticed that he began to have difficulty in climbing upstairs; that his gait became peculiar, and, as he expressed it, "resembled that of a camel." This condition gradually grew worse. He noticed that he was beginning to lose flesh, and that his lower extremities were beginning to be very thin. At first all this weakness was confined to the lower extremities, to the lower part of the back and muscles around the thigh, then it appeared to involve the muscles of the shoulders, and finally it attacked the muscles of the neck and the face. The latter the patient did not notice at all until his attention was attracted by myself to this condition.

The patient denied any alcoholic or syphilitic history; never had he had any rheumatism or any other severe illness previously to this trouble. He was formerly connected with an athletic club, and indulged quite freely in their sports; but mentioned, in connection with gymnastic exercises, that he noticed that while he was excellent at running *he very soon grew tired whenever he attempted any violent exercise with his upper extremities.* This last statement has led me to believe that although he may have noticed the weakness in the lower extremities previously to that of the upper, that the disease first showed itself in the upper extremities.

His mother is living and healthy; his father died of smallpox and was a heavy drinker. The patient has one brother and sister living, both older than himself and perfectly healthy. They are both married, and have children who are normal in every respect. A brother of his father died in an asylum for the insane; his father's father was of a gouty disposition. His mother's mother was rheumatic and asthmatic, otherwise the family history, which I have carefully investigated, having examined several members of the family, was negative.

Patient's condition in 1893: Patient was a bright and intelligent-looking fellow. The expression of the face was not at all unnatural, though it looked emaciated, and the voice and speech appeared normal. There was no distinct abnormality about the formation of the skull; the ear on the left side, however, appeared a little flattened and misshapen. The eyes were normal in every respect. Swallowing and chewing were accomplished without any difficulty. The tongue acted normally in all its movements. His general appearance was that of a person very much emaciated. He could stand without support; but, as soon as he attempted to walk, one noticed the great difficulty he had in lifting his legs, and a waddling gait. The emaciation was especially distinct in the neighborhood of the shoulders, back, and thigh regions. When he made an attempt to stand upright he assumed the position of one with a marked lordosis in the lower dorsal and upper lumbar region, and with a slight scoliosis in the lower dorsal. A plumb-line let fall from the prominence of the seventh cervical vertebra shows this line to be four and one-quarter inches distant at the deepest part of the lordosis, and one-half inch toward the right of the median line. On lying down it was impossible for him to turn over on his side or lift his head from the pillow. On asking him to stand up from the sitting position, he did so in a manner similar to the way which Gowers described to be so characteristic of cases of pseudo-hypertrophic paralysis. The patient presented the winged scapulæ and loose shoulders when one attempted to lift him from the floor. The paralyses were all of the lax order, and the muscles were soft and flabby. Covering them was a large amount of redundant skin. There were no contractures, no fibrillary twitchings. I could not find any vasomotor or trophic disturbances of any kind present. The sensation in regard to pain, temperature, tactile and muscular sensation was perfectly normal. The heart, kidneys, lungs, spleen, and liver were in perfect condition. There was no visible pseudo-hypertrophy, nor could I obtain from the patient any history of any such condition ever having been present. The deep reflexes were very much diminished on both sides. The nerves were not painful or tender on pressure, nor did they seem to be anywhere thickened. The spinal column was in no way tender to percussion, but presented the deformities above mentioned.

When we examined the muscles we found the following conditions present: A marked paresis and atrophy without hypertrophy of the following muscles: sterno-cleido-mastoid, trapezius, superior and inferior spinati, rhomboidei, latissimus dorsi, and serratus magnus muscles. The pectorals, deltoid, and triceps were also involved; the biceps, spinator longus, and brachialis anticus very much affected. The muscles of the forearm and hand appeared normal. Through this atrophy and paresis all the movements governed by these muscles were limited. The patient could hardly raise the arm to the horizontal position. At rest the shoulder appeared sunken and the scapulæ projected wing-like from the thorax. Mechanical excitability was very much diminished. The paresis and atrophy were symmetrical. The electrical examination gave quantitative changes, but no reaction of degeneration. The muscles around the thighs, the glutei, quadriceps, and the long muscles of the back were in the same condition of atrophy and paresis as the muscles above, thus disturbing the walk of the patient to a very great degree. The abdominal muscles were only very slightly affected. In the face, the muscles supplied by the seventh nerves suffered, especially the orbicularis oris and the orbicularis palpebrarum. There was also noticed a slight atrophy of the tongue on the right side. Just previously to his presentation before the Society, a piece of muscle was removed from the deltoid which I carefully examined. It presented but few histological changes, but still characteristic enough to substantiate the diagnosis. There was present a simple atrophy of the muscle-fibres with an increased cell-infiltration both in the muscle and in the connective tissue. This cellular infiltration was especially marked in the interstitial tissue between the muscular fibres. It was also present to a certain extent in the muscle. The muscles had still retained their structure. No hypertrophied fibres could be found. There was no evidence of fatty deposit anywhere in this particular piece of muscle. The small bloodvessels present in this specimen were filled with blood, and the walls were also infiltrated with round-cells.

Such was the condition of this patient when he was presented two years ago. There was no hereditary taint, excepting the alcoholic habit of the father and that an uncle had died in an asylum for the insane, which might predispose to degeneracy. In advanced youth he developed a progressive muscular atrophy in the particular group of muscles mentioned above. The localization of this atrophy, together with the area of distribution, the absence of electrical changes, of fibrillary twitchings, and of pseudo-hypertrophy, and the lack of all sensory disturbances, left no doubt that this was a case of the myopathic type. The form which it most closely resembled was that of the facio-scapulo-humeral type of Landouzy-Déjèrine. With regard to the fibrillary twitchings and electrical examinations, I would like to state that the former were frequently looked for, and the latter often made; but at no time could a trace of the former or a change in the latter be detected. A peripheral neuritis or lesion in the anterior gray horns could not in this case be thought of; for, if the former were present, we should not expect to find a simple atrophy of the muscles, but a degenerate condition would be present in this structure. We should also expect to find the reaction of degeneration. The absence of these characteristic symptoms, the constant absence of pain, the widespread character of the affection without reference to the distribution of the peripheral nerves, its continuance and progression during several years, preclude the diagnosis of a generalized neuritis.

The patient at that time was under my care, and, although the usual tonics and electrical treatment were thoroughly persevered in, no improvement was noticed. It finally occurred to me that electricity was, after all, but a feeble agent in stimulating the growth of the muscular fibres, as compared with the physiological stimulus of voluntary effort. I determined that it would prove worthy of trial to have this patient undergo a systematic course of physical training. This was to be indulged in daily, and never to be carried to the point of exhaustion. This, I believed, would at least induce further growth, and give greater power to those muscles or muscular fibres which had not suffered much damage. The very idea that the disease began late in youth, a period of perfect development intervening, according to the history of the patient, suggested that probably other influences co-operated with the congenital tendency, if there was any in this case, in developing this disease in this individual. Therefore, probably, if this influence could be overcome or checked, improvement must follow. What this influence was, the reader will not expect me to define; but that it may be arrested and improvement result to such a degree that almost all of the disagreeable symptoms in this patient disappeared, the patient now fully demonstrates. The method which he has pursued in order to undergo this systematic exercise has been the daily use from half an hour to an hour of practice with dumb-bells, Indian clubs, and a health-exercising machine.

There is no movement which he cannot now perform with the greatest ease. He walks more erect, and his lordosis, which showed four and one-fourth inches at its greatest depth when a plumb-line was let fall from the cervical vertebra, now shows only three inches; the scoliosis only one-quarter of an inch from the median line. The scapulæ by no means project as they did formerly, and the patient now puts on his coat, collar, and shirt without any assistance. He can raise his head from the pillow, he can turn about in bed, and walk great distances without the least exertion; his latest achievement is a ride of forty miles in one day on a bicycle. The waddling gait is no longer noticeable. No improvement has been noticed in the face, and, strange to say, this is the only part of the body that has not been subjected to forced exercise. The patient has gained in weight. Some of the muscles still show atrophy; the patellar reflex on the right side is retained; the improvement is especially in the muscular movements and particularly in the partial return of the normal contour of the atrophied parts.

Without wishing to claim too much for this method of treatment, as I have only this one case to report, it seems to me that when the chance is offered one should surely give this method a very careful and thorough trial. I do not think it will be efficacious in those cases in which the disease begins early in infancy, and in which the muscles have been but poorly developed; but where the disease begins in advanced youth, and the muscles have been previously perfectly developed and then begin to undergo atrophy, in such cases I think we may expect the improvement which has been obtained in this patient. And in addition to the success of the therapeutic efforts in this case, the possibility of improvement having been here demonstrated will, I hope, take some of the cases of progressive dystrophies out of the category of incurable maladies.

I wish to express my thanks here to Dr. B. Sachs, of this city, for the material which he has placed at my disposal and his kind assistance in many other ways.

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# TRAUMATIC ANEURISM OF THE FEMORAL ARTERY THIRTY-EIGHT DAYS AFTER GUNSHOT-WOUND OF FEMUR; LIGATION IN HUNTER'S CANAL; RENAL COLIC AS A COMPLICATION.

By George Tully Vaughan, M.D.,

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J. H., captain of a schooner, aged thirty years, native of New Jersey, was admitted to hospital, May 27, 1895, with fracture of the right femur caused by a conical ball fired from a Winchester rifle on the same morning. Patient was running at the time, and fell immediately on being struck. On attempting to rise he found that he was unable to do so, and a few minutes later fainted. The wound bled freely, but was dressed by a physician, who did not probe it, and the patient was then transported by rail some ninety miles to the city. On examination under ether, twenty-four hours after the injury, a complete fracture of the femur in the lower third was detected. A single wound on the posterior surface of the thigh, about 20 cm. above the knee, marked the entrance of the ball—apparently a 48 in size.

There was no wound of exit. A probe was passed, without force, downward and forward between the fragments of bone to the front of the thigh, where the point could be felt about 8 cm. above the upper border of the patella. The synovial cavity of the knee was distended with fluid, the nature of which was not determined, floating the patella; but all attempts failed to locate the ball. The wound was dressed with aseptic gauze, and a Buck's extension-apparatus with five pounds and sandbags was applied. The temperature rose a little, being 38.5° C. May 29th, 40° on the 30th, after which it descended, so that on June 5th it was normal.

*June* 19. The swelling in the thigh and knee having subsided, a plaster-dressing was applied from hip to toes with a window over the wound for dressing. There had been no suppuration, only a slight discharge of bloody serum, which had almost ceased.

*July* 4. The condition of the patient had been satisfactory, though there were occasional pains in the limb, but they were not regarded as serious. To-day, however, at noon, he felt severe pain at the site of the fracture, which continued all night, preventing sleep, and he was suffering extremely when I saw him at 10 A.M., July 5th. Temperature 38°; pulse 85. The plaster was removed at once, revealing a large swelling with deep fluctuation on the inner side of the thigh above the location of the fracture. Considering the length of time since the injury, the condition was not believed to be caused by hemorrhage, but rather to an accumulation of pus by infection from the ball, although there had been no suppuration from the wound. The patient was etherized and the tumor carefully opened, first by an incision through the skin and fascia,and then by boring a grooved director through the muscle, when blood and clots began to escape. A rubber tourniquet was applied and the incision extended until the tumor was well laid open, evacuating about 1000 c.cm. of blood-clot. At the bottom of the cavity thus formed the femoral artery was seen with a rupture in it between 1 and 2 cm. in length, just above the opening in the adductor magnus muscle.

The artery was ligated with silk above and below this opening, the cavity packed with iodoformized gauze, and a dressing applied. No loose fragments could be felt about the fracture, though a sharp-pointed one was apparent to the touch, near, but not pressing on the artery. The fragments were pretty well surrounded with callus, but there was still some motion. At the close of the operation the patient was extremely weak and death threatening. Five hundred cubic centimetres of normal salt-solution were injected subcutaneously in the breast. Hypodermatics of strychnine were given and warm applications made to the extremities. The leg on the affected side was cold, but four hours after the operation the circulation was almost as good as that of its fellow. There was little fever after the operation, the temperature reaching only 38.4° C. for three or four days.

*July* 14. The gauze was removed for the first time from the cavity. There was no pus or blood, and the wound was closed with adhesive plaster and the sandbags reapplied, but without the extension. There was steady progress to recovery after this, the wound healed and there was firm union of the bones, when, on August 29th he had an attack of renal colic, with severe pain in the right lumbar region, frequent micturition, burning in the urethra, and vertigo. Temperature 37.5° C.

*September* 1. Temperature reached 39°. Nausea, but no vomiting. Constipation. Urine contained pus, excessive amount of urates; specific gravity 1026.

*3d.* Patient was chilly yesterday, and his temperature was 40°. Temperature the same to-day, and he has been vomiting. The pain is located exactly at "McBurney's point," and there is tenderness there on pressure, caused, no doubt, by the gravel lodging at that point in the ureter. Appendicitis was suggested, but was excluded by the history of attack and the continued presence of pus in the urine.

*6th.* Patient passed a gravel about the size of a pea, rough and jagged, after which there was no more pain or fever.

On the 8th he was allowed to get up, and was discharged, recovered, October 12th, with 4 cm. of shortening of the right femur, but with good use of the limb.

*January* 13, 1896. Patient came to my office and was in excellent condition. Said he had slight rheumatic pains in damp weather and numbness along the inner side of the leg and foot, this latter symptom no doubt, being due to injury of the long saphenous nerve at the time of the operation, although the nerve was not observed at that time.

The points of interest in this case are (1) the probable manner in which the artery was injured, whether by the bullet or by a fragment of bone, and, if by the latter, whether the injury was done at the time the wound was received, or later by manipulating the thigh.

As the probe following the track of the bullet passed through the bone without any lateral deviation, it does not seem possible that the bullet could have touched the artery, unless, having split on the bone, a section was deviated in that direction. Possibly the attempt to rise or the unavoidable motion produced in transferring the patient such a distance to the hospital may have caused bruising of the arterial coats by a fragment of bone. It is not likely that the damage was done later, as immobility was established and maintained soon after admission to hospital.

2. The long time which elapsed, thirty-eight days before the occurrence of hemorrhage; in that respect resembling the case of President Garfield, in which the artery ruptured something more than two months after having been grazed by a bullet.

The rational explanation seems to be that the arterial coats were bruised by a section of the ball or a fragment of bone, and might have recovered without rupture, but for the strain thrown upon the bloodvessels by the increased flow of blood incident to the formation of new bone and the repair of the injured tissues.

3. The complication of a serious attack of renal colic.

# REVIEWS.

TRAITÉ DE CHIRURGIE CÉRÉBRALE. By A. BROCA and P. MAUBRAC. With 72 illustrations. 8vo., pp. 586. Paris: Masson & Co., 1896.

CEREBRAL SURGERY. By BROCA and MAUBRAC.

ON the whole, the best two books on cerebral surgery, that of Chipault and the present book, are written by Frenchmen. It is to be regretted that, though Englishmen and Americans have cultivated cerebral surgery perhaps more than any other nation, yet for systematic treatises on the subject we must go to Paris.

The book under consideration, like almost all French books, has one glaring defect. There is *no index* whatever, and for a book of nearly six hundred pages, dealing with an immense number, not only of subjects, but especially of details of diagnosis and treatment, this is inexcusable. If, for instance, one wishes to know what the authors have to say on any particular subject, he must hunt laboriously through the "table of contents" for the general subject, and then page after page for the special topic of which he is in search. For consultation, therefore, French books are almost useless. Another fault, which is not infrequent in French books, is the misspelling of foreign names. Thus Eiselberg (p. 120), Stüglitz (p. 120), Stacke (pp. 268, 291, 293, 314), Oyer (p. 388), Parkins (p. 506), Bartolow (p. 564) are misprints for Eiselsberg, Stieglitz, Staacke, Cryer (!), Parkin, and Bartholow, while W. White and L. Dana serve for J. W. White and C. L. Dana.

Having pointed out these two faults, however, which, especially the last, are, of course, of minor importance, we are through with criticism, and can only bestow the highest praise on the book. All in all, it is perhaps the most judicial in its conclusions and complete in its treatment of any book on the subject. Like the work of Chipault, it shows the widest acquaintance with American, English, and German as well as French authors. Scarcely a case that we are familiar with, even in minor American journals, has escaped the eyes of the authors.

The book begins with the anatomy of the convolutions, cranial topography, and cerebral localization. These are followed by the clinical indications for surgical interference, the operative technique, and the dangers of intervention. This constitutes the first part. In the second, Chapter I. deals with traumatic lesions, under which are considered cerebral compression, foreign bodies, paralysis after injury, abscess, headache, and epilepsy following traumatisms. In Chapter II. the intracranial complications arising from disease of the ear are described. Chapter III. treats of tumors; Chapter IV. of hemorrhage, softening, meningitis, cerebral abscess not arising from either injury or ear-disease, and general paralysis. These are followed by chapters on hydrocephalus, microcephalus, epilepsy other than traumatic, psychoses, headache, and encephalocele. This very brief analysis will give our readers an idea of the scope of the work.

In the matter of the topography of the brain the authors are probably right in advocating theoretically a method by proportions; but at the same time they believe that at present other methods by absolute measurements must be the necessary complement of the first. A half-dozen or more methods are described and excellently illustrated. They notice (p. 389) Doyen's temporary exploratory hemicraniectomy, which "permits us to open the cranium as we open the abdomen and to uncover and explore in a case of uncertain diagnosis an entire cerebral hemisphere from forehead to occiput," but significantly add, "there is undoubtedly in this somewhat of an exaggeration" It is, however, undoubtedly useful always to have a large opening. They are, on the whole, in favor of the trephine and the rongeur-forceps, and rather throw discredit on Wagner's temporary osteoplastic resection; a method which is undoubtedly gaining in professional esteem, and which the personal experience of the reviewer favors very much. It is with some little surprise (p. 121) that we observe the authors state "that it has only been employed in relatively rare cases in man."

One bit of advice comes with especial propriety from so well known a surgeon as Broca, namely, that the surgeon should always call in the neurologist for consultation (p. 97). No surgeon, be his skill what it may, in our opinion, is justified (saving, of course, in perfectly plain traumatic cases and the like) in opening a head, for instance, for tumor, abscess, epilepsy, or other similar disease, without the consultation and co-operation of a neurological specialist.

We are somewhat surprised to observe (p. 142) that the authors discourage the search for balls in gunshot-wounds. The tables of Wharton and Bradford and Smith, showing that the cases in which such foreign bodies were removed had a mortality of about one-third, whereas in those cases in which the missile was not removed the mortality was about 54 per cent. to 58 per cent., should convince surgeons that abstention ought not to be the rule. Of course, the surgeon must have the good sense not to interfere in every case; but in the majority of cases, if the ball is within reasonable reach, undoubtedly it should be removed. Contrary to the generally accepted belief and also to the experience, we think, of most surgeons, the authors state that in abscess (p. 326) there is a distinct rise of temperature. So many cases have been reported with a subnormal temperature that we do not think sufficient importance has been given to this otherwise anomalous symptom. In traumatic epilepsy the authors give their judicious approval of operation. This opinion finds, even in focal epilepsy, a strong support in the recent papers of Sachs and Gerster before the American Neurological Association, and seems to us in accordance with sound surgical judgment.

The chapter on the Cerebral Complications from Disease of the Middle Ear is not only full, but admirable. The authors have pointed out with great clearness the dangers of various forms of abscess and of pyæmic thrombosis of the various sinuses. One fact which is not, perhaps, appreciated so much by both surgeons and otologists is, as Allport has recently pointed out (*Journal of the American Medical Association*, 1892, vol. xix.), that other sinuses, especially the superior petrosal, are even more frequently thrombosed than the lateral sinus. Inasmuch as these other sinuses are as yet inaccessible to the surgeon, the importance of the thrombosis has not been sufficiently recognized. We should call attention to the fact, however, that the superior longitudinal sinus is quite as accessible as the lateral to surgical interference, and that in case of thrombosis of this sinus it should be attacked precisely with the same boldness that the lateral sinus has been. Macewen has reported three such cases in his admirable work. We are glad to see that the authors insist on a speedy and thorough operation in cases of sinus-thrombosis. No halfway measures save life in this form of pyæmia, and we thoroughly agree with them also in the direction that the ligation of the jugular should be the first step of the operation before opening the sinus itself. The great danger in sinus-thrombosis is extension of the clot into the superior vena cava, the heart, and the lungs, hence the first prophylactic step should be the ligation of the vein. The authors have only collected 57 operations for thrombosis (p. 312), with 23 recoveries and 34 deaths, a mortality of 59.6 per cent. The reviewer (*International Encyclopœdia of Surgery*, vol. vii. p. 600) tabulated two years ago 86 cases, which quite reverses the figures of the authors, as this table gave 58 recoveries and 28 deaths, a mortality of only 32.6 per cent.

In operating upon abscess of the brain of otitic origin the authors strongly recommend (p. 354) the mastoid route rather than a separate trephine-opening, and we must confess that the reasons they give are very strong. Surgeons, especially English and American, have operated more after Barker's method by second trephine-opening for the temporo-sphenoidal lobe, and a third for the cerebellum should it be necessary; but, influenced by what is here set forth, we should certainly be disposed to give a test to the mastoid route, especially as it gives access with equal readiness to either a cerebral or a cerebellar abscess.

The chapter on Tumors is excellent and the counsel most judicious. One point in the matter of statistics, which has not perhaps been appreciated by neurologists particularly as much as it ought to be, is that data drawn from autopsies as to the operability of cerebral tumors are fallacious, because they represent the final stage of the tumor when it has reached its largest size, is most widely infiltrated, and has done its greatest damage, whereas, had the tumor been attacked early in its existence, it might have been removed with relative ease. In considering the dangers of extirpating tumors, opening the ventricles is accorded the first rank. A recent case in the experience of the reviewer, in which the lateral ventricle was widely opened (a report of which will soon appear in this JOURNAL), would seem to show that this danger is not so great as has been supposed. In the case referred to, not only was the ventricle widely opened, but it was packed with iodoform-gauze, and the patient made an excellent and speedy recovery without any complication. Cerebral hemorrhage is well treated in accordance with the most advanced ideas. The technique of puncture of the lateral ventricles and of lumbar puncture, as developed by Quincke, and the value of each, are described fully and with conservative conclusions. We are glad to see (p. 576) that they disapprove of the extensive excision of the brain-cortex practised by Burckhardt for psychoses. The procedure does not seem to us rational, the results have not been satisfactory, and operations extending over three to four and a half hours in length are certainly full of the gravest danger. As will be seen, while not always entirely agreeing with the authors, yet we consider their book one of the most valuable that we have read for a long while, and commend it freely and fully to our readers as fully abreast of the times.

W. W. K.

Die Otogene Pyämie. Von Dr. Hugo Hessler, Docent der Ohrenheilkunde an der Universität Halle a. s. Pp. 500. Jena: Gustav Fischer, 1896.

Otogenous Pyæmia. By Dr. Hugo Hessler, Instructor in Otology in the University of Halle.

This work of Hessler is the logical and more comprehensive successor of the very valuable treatise upon otitic lesions of the brain and its sinuses, by Forselles, in 1893, and Jansen and Koerner, in 1894 and 1895. Even a cursory reading of this work on otogenous pyæmia will impress anyone with the earnestness, candor, industry, and ability of its author. His endeavor to add something of practical value, based on pathology, to our present knowledge of otogenous pyæmia has been admirably sustained. The work contains chapters on the History of the Literature of Otitic Pyæmia, on Pyæmia in General, the Anatomy of the Ear, Cases and General Statistics, a Summary of the Conditions Found in the Record of Numerous Cases, Pathological Anatomy, Symptomatology, Bacteriology, the Course, Result, and Prognosis, Diagnosis, and Treatment. "The difficulties of diagnosis of otogenous pyæmia, notwithstanding the great additions to our knowledge of this subject, are not diminished." The chapter on Treatment (pp. 447–500) opens with these words: "The treatment most satisfactory to both patient and physician is a prophylactic one." In other words, be careful what you do in the acute stages of the primary ear-disease.

"The general symptoms, high fever, the initial chill, the involvement of the sensorium, in a case of acute otitis media, should lead to the conclusion that the affection will not run a simple course, and we must expect complications. . . . In such cases the inflammatory conditions in the middle-ear and drum-membrane are usually more severe than in simple ones, and extend to the external auditory canal. . . . In such instances simple paracentesis of the membrana tympani is insufficient to prevent retention of pus in the drum-cavity, but a large opening must now be made in the membrana and maintained, in order to prevent a subsequent retention of pus, which may occur in the uncertain course of aural suppuration." Thus drainage is obtained and continued, and retention of micro-organisms prevented. "Inflations by Politzer's method should be avoided, as they tend to force fresh quantities of micro-organisms from the naso-pharynx into the middle-ears, and bring about fresh infection. . . . The treatment of the entire aural suppuration must be *aseptic;* it seems doubtful whether antiseptic treatment is as useful as was once thought," because the remedies thus named have been shown to contain septic germs and to cause secondary infection.

"If osteophlebitis occurs in the temporal bone, in addition to paracentesis of the membrane, the diseased bone must be removed, not only in the region of the tegmen tympani, but also in that of the floor of the drum-cavity and in the hinder and inner wall of the mastoid, in order to explore the sinus and the jugular vein." If relief of symptoms of pyæmia do not follow such operation, and subdural abscess is suspected, "the bone which appears normal externally must be chiselled away, the dura exposed, and the abscess emptied."

If symptoms of thrombophlebitis occur, the surest way to decide "whether or not a thrombus exists in the transverse sinus or in the jugular vein is to make an exploratory puncture in the sinus. . . .

It is not necessary, however, to open the sinus and clean it out on account of the presence of a simple thrombus, as long as the latter shows no disposition to purulent degeneration and the formation of emboli. In the latter instance the sinus should be opened, or any pre-existing fistula in it enlarged, the broken-down and purulent thrombus removed, and double ligation and excision of the jugular vein in the neck performed, in order to effect cleansing of the sinus from this point and prevention of the escape of portions of the thrombus into the circulation."

The result in metastatic cases is less satisfactory than in those without metastasis. Though operations have done much for the relief of otogenous pyæmia, the author deprecates a hasty resort to operations, since in some instances spontaneous recovery of sinus-phlebitis has occurred, and also cases of simple thrombosis have been converted into metastatic ones by the admission of infection to the circulation by the operation.

Though the advances of otology in the past ten years have been great in the treatment of otogenous pyæmia, "much yet remains to be discovered respecting the diagnosis and treatment in order that the true end of any treatment, viz., prophylaxis, may be attained. That is the task of the present, and it is probable that here, too, bacteriology, the youngest department of practical medicine, must point out the way."

It is to be regretted that so valuable a guide as this work is untranslated into English. This fact must be our apology for presenting so many translated quotations from the book. C. H. B.

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MEDICAL JURISPRUDENCE, FORENSIC MEDICINE, AND TOXICOLOGY. By A. WITTHAUS, A.M., M.D., and TRACY C. BECKER, A B., LL B. With numerous collaborators. Vol. III., pp 697. New York: William Wood & Co., 1896.

THE third volume of this ambitious work is concerned with the following subjects: Vision and Audition in their Medico-legal Relations, the Medico-legal Aspect of Insurance, Insanity in its Relations to Medical Jurisprudence, Mental Unsoundness in its Legal Relations, and the Care and Custody of Incompetent Persons. To the consideration of these five subjects 683 pages of text are devoted, a fact which gives some idea of the magnitude of the entire work, which has both the merits and defects of so many similar "Systems." It is not just to apply to them the criticism of Carlyle on the ready writers—to class them as ever-swelling tides of ditch-water; and yet they impress one with the idea that quantity and not quality, that a redundancy of facts and not a literary form are what is sought for by the editors, contributors, and publisher.

The article by Dr. Edward D. Fisher, on Insanity in its Relation to Medical Jurisprudence, is an excellent presentation of the entire subject of insanity, both in its medical and medico-legal relations. By the omission of the portion pertaining to Medical Jurisprudence, and the addition of sections on treatment, it would serve for a medical treatise on the subject. The paper is carefully written, and will add to the already high reputation of the author as a neurologist and alienist. With the article on Mental Unsoundness in its Legal Relations, a subject which is ably presented by Mr. Becker, one of the editors of the *Treatise*, it fully covers the subject of insanity in its relation to the law. Dr. Fisher introduces the body of his article with a discussion of the difficulties of the subject, and its most important medico-legal bearings. Here and there throughout the article important medico-legal points are brought out, as when discussing hallucinations, illusions, imperative conceptions, lucid intervals, etc. Mr. Becker's article is rich in its interesting citation of cases. He presents from the legal standpoint the relations of insanity to the civil law, the taxation of the property of a lunatic, the statutes of limitation in their application to the insane, wills and testamentary capacity, and the criminal responsibility of the insane. Hypnotism is one of the few subjects which does not seem to have received the full consideration which its recently acquired importance demands.

Goodwin Brown, Esq., New York State Lunacy Commissioner, brings together in convenient shape for general use the statutes and methods of procedure relating to the care and custody of incompetent persons and their estates. Matters of this kind are familiar to members of the legal profession, but not, as a rule, to physicians, who will here find them compiled and conveniently arranged for their use. The methods of procedure in cases of inquisition in lunacy; in cases of petition for a supersedeas, when recovery from lunacy is alleged; the question of costs in lunacy proceedings; of committees and guardians; and of the management of estates, and the care and restraint of persons of unsound mind, are presented with sufficient fulness. The compilation by Mr. Frank H. Gilbert of the digested statutes of all the States relating to the care and custody of incompetent persons and their estates, and the commitment and confinement of insane persons, will be found of great value for reference.

Although this is a work on Medical Jurisprudence, the article by Dr. J. H. Woodward on the Medico-legal Relations of Vision and Audition contains little of a medico-legal character. Excellent descriptions of the eye and its diseases and injuries, of the methods of examination for disorders of refraction and accommodation, and important points in the diagnosis of ophthalmological affections are well presented, but with scant reference, and in some instances with no reference at all, to the medico-legal aspects of the subjects. This criticism does not apply to the descriptions which are given of the best methods of testing simulated blindness, and similar practical matters which come strictly within the province of the medical jurist. The methods of Bravais, Michaud, and others of examining for simulated blindness by means of color-tests are given, and constitute one of the most interesting portions of Dr. Woodward's article.

The article on Insurance, by David Murray, Esq., and Guy J. Edwards, Esq., is a clear presentation of the most important medico-legal facts relating to life and accident insurance. Numerous cases are cited and brought together. The authors adhere to their express determination to confine themselves "strictly to those cases wherein the science of law and medicine must co-operate to elucidate properly the questions involved in determining the nature and effect of the contract between the insurer and the insured."

This volume will prove of most value as a work of reference for physicians and lawyers, and as a mine of information for teachers and writers on medical jurisprudence. The indexed "Table of Cases Cited in the Volume" will be found of especial value in preparing cases for court. The book is clearly printed on good paper. C. K. M.

LECTURES ON APPENDICITIS AND NOTES ON OTHER SUBJECTS. By ROBERT T. MORRIS, A.M., M.D., Fellow of the New York Academy of Medicine, etc. New York and London: G. P. Putnam's Sons, 1895.

DR. MORRIS has put in book-form his lectures on appendicitis, added to which is a series of notes on other subjects. In the first chapter the useful rules are laid down for the preparation of the patient and surgeon preliminary to the operative procedure. Chromic gut is the medium employed for all sutures, except for ligation of the inner tube of the appendix. The author lays considerable stress on the fact that the surgeon must personally attend to the preparation of his own catgut to reach the idealism of aseptic work. He suggests that a fixed standard be established for determining the size of catgut, based upon the American standard wire-gauge. The only irrigation used is the normal saline solution and hydrogen peroxide. Common boiled and distilled water, so generally employed by other surgeons, is regarded as an irritant to the tissues, and is somewhat corrosive in peritoneal operations, as it injures the serosa slightly, and may be sufficient to close the mouths of the lymphatics, upon which so much depends for carrying off septic material.

In the chapter on appendicitis proper the subject is well treated from a clinical and bacteriological standpoint; much stress is laid upon bacterial invasion, and many clear and practical deductions are drawn from them. As we find with mixed bacilli or streptococci, the temperature ascends, and when the latter abound the temperature may go as high as 105°; but when the colon-bacilli assume control the temperature may drop to 100° while the disease is in progress. A colon-bacilli temperature may be normal or subnormal from the onset. The toxins of colon-bacilli do not tend to elevate the temperature, but they do pull the vital tissues apart most insidiously, explaining why we so often find a pulse of 120 and a temperature of 99°. The pulse becomes important when it indicates the degree of intoxication of the sympathetic nervous system, although complete destruction of the appendix may take place without producing much change in the character of the pulse, showing that neither the pulse nor the temperature can be depended upon as indices to the destruction of the appendix proper.

A somewhat graphic picture is drawn of two supposed cases treated, on the one hand, by the usual conservative or expectant method, and, on the other, by early operation on the first day. The contrast as depicted by the author is unquestionably true.

The last chapter is devoted to operative technique, in which much stress is laid upon a one-and-one-half-inch incision, in which the skin has been previously made tense by two tenacula introduced and drawn in opposite directions. This insures a very clear skin-incision, which heals without much scar, while an opening of this length in the peritoneum will suffice for the removal of an uncomplicated appendix. To attempt to follow this rule is inadvisable, often tending to prolong the operation unnecessarily, and especially so when the operator is wedded to a very small skin-incision. Dr. Morris strongly condemns the use of the drainage-tube, as also the plan of packing with gauze. He considers that the best results as to drainage are obtained by the wick-drain surrounded by rubber tissue. Nevertheless, the drainage-tube and gauze-packing have long been in use and have many advocates among surgeons of extensive experience. A table of one hundred cases is appended, showing that the results in septic peritonitis are as gloomy as those in the hands of other operators.

Many of the plates are very good, being photographic reproductions from sketches by Dr. MacDonald. There is no attempt on the part of the author to make an exhaustive treatise of the subject, he being content to put in a clear and concise form the results of his observations. His extensive experience in this line of work is bound to be treated with respect, and commends itself to all who are interested in the subject, whether viewed from either a medical or a surgical standpoint. The appended notes on other subjects, many of which are most interesting, have appeared in various periodicals, and would have much better, in our judgment, been omitted. The book is well mounted, and is of the highest order of work, reflecting credit upon its publishers. R. H. H.

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TRAVAUX DE NEUROLOGIE CHIRURGICALE (1895). Par A. CHIPAULT, BRAQUALAYE, DEMOULIN et DALEINE. 8vo., pp. viii., 352. Paris: Battaille et Cie, 1896.

CONTRIBUTIONS TO SURGICAL NEUROLOGY.

THIS volume by Chipault and his collaborators is both peculiar and useful. It is intended to be the first of a series dealing with the surgery of the nervous system, in which will be gathered together all the work which they may have done in this department year by year. It also includes as addenda to their own work papers written by various surgeons on the same subjects, and gives a *résumé* of each reported case, reproducing all important illustrations, though not always so artistically as we could wish. Each volume will be independent of the others in the series.

The best idea of the book can be obtained from an analysis of its contents. It is divided into three parts: First, the Cranium and Brain; second, the Spine and Spinal Cord; third, the Nerves. Under the first are considered or reproduced some old observations of the cranial surgery of the sixteenth century. This is followed by the consideration of fractures of the base of the skull, pericranial lipomata, the surgical treatment of intracranial tumors, and the surgery of the internal capsule. Under the second the anatomy of the spinal cord, the surgery of Pott's disease, osteoplastic surgery of the spine, surgery of fractures and dislocations, and also ligature and suture of the vertebræ, resection of the nerve-roots within the spinal canal, and lumbar puncture. Under the third, facial palsies of otitic origin, including a case of resection of the canal of Fallopius, the ill-results from the incision of Wilde, lesions of the brachial plexus and the treatment of mal perforant by elongation of the plantar nerves.

It has a list of figures, a table of contents, and an index of names of authors cited, but unfortunately *no index* to the contents of the book.

The book is a most admirable one, especially in gathering together all the cases and observations in certain departments of the surgery of the nervous system, and will save an immense deal of future labor to both surgeons and neurologists.

Few men have done so much work in this department of surgery as Chipault, and one is sure to learn something from each of the many papers from his indefatigable pen and pencil. W. W. K.

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### AN AMERICAN TEXT-BOOK OF SURGERY FOR PRACTITIONERS AND STUDENTS. Edited by W. W. KEEN, M.D., and J. WILLIAM WHITE, M.D. Second edition. Philadelphia: W. B. Saunders, 1895.

HOWEVER disappointing this text-book may be to a few in teaching, its extraordinary sale and adoption as a text-book are evidences of its popularity.

The additions to the text since the first edition comprise the effect of modern small-arms in military surgery; a new section on Acromegaly; the Hartley-Krause method of removing the Gasserian ganglion; the osteoplastic method of resection of the skull, with a number of additions to operations and methods in endocranial and spinal surgery; in the surgery of the chest, a description of Schede's operation; in the surgery of the digestive tract, Witzel's method of gastrostomy; the use of the Murphy button in intestinal anastomosis; the consideration of retroperitoneal tumors and of castration for enlarged prostate; a chapter on Symphyseotomy; Macewen's method of compressing the aorta in amputation at the hip-joint.

The sections dealing with Fractures and Dislocations, Appendicitis, the Radical Cure of Hernia, and the more recent methods in Amputations of the Breast have been especially enlarged, particularly in the matter of treatment. Displacements of the uterus have also been regrouped and the chapter largely rewritten. Tuberculosis of the testes receives too scant attention. There is space devoted to resection of the liver. In the chapter on Fractures there are too few descriptions of methods. There are too few illustrations of apparatus in position. Orthopedic surgery is confined wholly to deformities. The surgery of the nerves is concise and accurate. The treatment of diseases of the joints is old-fashioned and out of date. The chapter on Diseases and Injuries of the Head is a splendidly written one and fully up to date.

C. L. S.

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### COLOR-VISION AND COLOR-BLINDNESS. A PRACTICAL MANUAL FOR RAILROAD SURGEONS. By J. ELLIS JENNINGS, M.D. With illustrations. Philadelphia: The F. A. Davis Co., 1896.

THIS little manual, which opens with a historical sketch of color-blindness, discusses the physiological anatomy of the retina, the physics of light, the theories of color-perception and color-blindness, and the various methods for detecting color-blindness. Among these, Holmgren's method, Thomson's adaptation of the colored wools, and Oliver's worsted-test are especially mentioned. The author has devised a worsted-test of his own.

One chapter is devoted to acquired color-blindness, and describes disturbances of the color-sense in connection with diseases of the optic nerves and visual centres. It does not include, as it might have done, reference to the color-sense of hysteric and neurasthenic subjects.

The book concludes with the reproduction of the Pennsylvania Railroad Company's instructions as to examinations for vision, color-blindness, and hearing, and a description of Oliver's series of tests for the detection and determination of subnormal color-perception.

Dr. Jennings has gathered together in a convenient form the essential facts of his subject, and his book will be especially useful to those whose duty it is to make examinations of the color-sense of men employed on railroads and steamboats. Dr. Jennings has consulted most of the standard books on this subject, but the two most important works recently published in this connection have entirely escaped notice, namely, Abney's *Color-vision* and Mauthner's *Farbenlehre*. G. DE S.

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STUDENTS' AID IN OPHTHALMOLOGY. By GERTRUDE A. WALKER, A.B., M.D., Clinical Instructor in Diseases of the Eye in the Woman's Medical College of Pennsylvania. With forty illustrations and a colored plate. Philadelphia: P. Blakiston, Son & Co., 1895.

THIS book, according to the author's statement, "is intended for study preliminary to a course of clinical lectures upon the eye, or for reference during attendance upon such course." An attempt to condense within a short space the facts in ophthalmology, or in any other branch of medicine, frequently fails to make clear the most essential portions of the descriptions. The author has not always escaped this pitfall.

In the chapter on Operations there are some curious contrasts: Four lines are devoted to a description of the operation for trachoma, the so-called rolling operation, and nearly a page to tarsorrhaphy, a comparatively infrequent ophthalmic procedure. Here and there are some statements which require modification—a modification which we trust they will receive in future editions; for example, "Sarcoma of the choroid is confined exclusively to adults;" "An injured eye, even if not blind, is always a menace to its fellow, and enucleation should in most cases be advised." But there are many excellent things in this little book, and its arrangement is capital. It is well written in most portions; indeed, it fails to be clear only when the author has been hampered by her lack of space and has been obliged to condense her statements too much. We wish the book and its mission much success. G. DE S.

# PROGRESS

OF

# MEDICAL SCIENCE.

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## THERAPEUTICS.

UNDER THE CHARGE OF

REYNOLD W. WILCOX, M.D., LL.D.,
PROFESSOR OF MEDICINE AND THERAPEUTICS AT THE NEW YORK POST-GRADUATE MEDICAL SCHOOL AND HOSPITAL; VISITING PHYSICIAN TO ST. MARK'S HOSPITAL.

### THE ABSORPTION OF DRUGS BY THE HEALTHY SKIN.

DRS. G. LINOSSIER and M. LANNOIS conclude that volatile bodies, notably those which, in spite of a high boiling-point, possess a certain vapor-tension at ordinary temperature, can be absorbed by the healthy skin in amounts well beyond the usual therapeutic doses. This absorption is regular, subject to invariable laws; for the two drugs studied, guaiacol and methyl salicylate, the dose can be made according to the therapeutic indication as well as if they were to be absorbed by the intestinal tract. Some remedies can thus be employed in massive doses without risking any disturbance of the digestive functions which might follow their administration by the mouth. Apparently methyl salicylate can be administered by the skin as an advantageous substitute for the use of sodium salicylate given by way of the mouth.—*Bulletin Général de Thérapeutique*, 1896, 8e liv. p. 238.

### INJECTIONS OF CALOMEL FOR SYPHILIS.

DR. LOUIS JULLIEN remarks that the subcutaneous method possesses two advantages: The liver and the alimentary mucous membranes are spared. Dilatation of the stomach is frequent in old syphilitics, cirrhotic changes have been noted in the liver, and even hepatic neurasthenia, a variety of syphilitic neurasthenia, may be produced. The vehicle used is liquid vaseline; the dose varies from one to two grains, according to the size of the individual; the locality is preferably the supra- and infra-spinous fossæ of the scapular region; strict asepsis must be enforced, and the interval between the injections varies according to circumstances; it may be from eight to twenty or more days. Among the advantages can be cited the promptitude of its effects, the intensity of its action, and the persistence and positive character of its cures —*Archives Générales de Médecine*, 1896, No. 5, p. 513.

### THE USE OF IODOL IN VENEREAL DISEASE.

DR. DOMENICO MAJOCCHI reports the results obtained from the use of this remedy during the past four years. In venereal ulcers, five hundred and fifty-eight patients, the remedy, alone or with equal amount of calomel, has given the best results. Previous to the application the ulcer must be disinfected and carefully dried. One hundred and eighty-seven cases of infecting chancre, thirty-one of granular erosions of the cervix uteri, and four of vaginal *esthiomene* were also treated. From this extended experience he concludes (1) that since it is odorless it is more acceptable to the patients. (2) It is not poisonous even when spread over extended areas; this is more than can be said of other iodine-preparations. (3) It strongly modifies the ulcerative processes, producing in a short time an antiseptic action, and hastens cicatrization. (4) The present preparations are quite stable and do not give rise to symptoms of irritation.—*Therapeutische Monatshefte*, 1896, Heft 4, S. 201.

### THE TREATMENT OF GONORRHŒA BY ARGONIN.

DR. A. LEWIN has found that this remedy, a white powder, which is silver-casein, soluble in water up to 10 per cent. on careful warming over a water-bath, destroys gonococci rapidly without producing any irritation. It should be dissolved by warming with water, in 1½ per cent. solution, the amount used in two and one-half drachms, and retained five minutes. Of twelve cases observed, in nine the gonococci permanently disappeared in from two to six days. The secretion which persists after the discontinuance of this drug can be relieved by the use of zinc sulphocarbolate and other drugs. On account of the absence of irritating properties it seems especially useful for the treatment of the early stages of the disease.—*Berliner klinische Wochenschrift*, 1896, No. 7, S. 146.

### THIOSINAMINE.

DR. SINCLAIR TOUSEY believes that this drug possesses positive curative properties in causing the resolution of benign and malignant tumors and the absorption of cicatricial tissue. The process of manufacture is by mixing two parts of oil of black mustard-seed, one part of absolute alcohol, and seven parts of aqua ammoniæ (specific gravity 0.960), warming to 104° F., and after a few hours evaporating over a water-bath. The odors of mustard and ammonia disappear, and on cooling small acicular crystals of a bitter taste and garlicky odor of allylsulphocarbamide or thiosinamine are deposited. These are soluble in diluted alcohol and ether, but decompose in an aqueous solution. The drug is used hypodermatically in a 10 per cent. alcoholic solution, up to one and one-half grains injected into the muscles of the arm and forearm. He concludes that this drug, when given hypodermatically, produces no general symptoms, and, even when long continued, no harmful effects. It acts specifically upon certain abnormal tissues to cause their absorption or conversion into normal tissues. It is of doubtful efficacy in lupus and a variety of skin-diseases; but it is of the greatest possible value in the removal of cicatricial contractures following lupus or any other cause of loss of substance. The frightful contractures from burns of the neck yield to its action, as cases of ectropion and corneal opacity do. It has a curative effect upon keloid and a palliative and probably curative one in malignant tumors. —*New York Medical Journal*, 1896, vol. lxiii. p. 579.

### EUCAINE HYDROCHLORATE.

DR GAETANO VINCI has experimented with this drug as a local anæsthetic. Instilled into the eye as a 2 to 5 per cent. solution, complete local anæsthesia is obtained in from one to three minutes, with but slight hyperæmia and slight irritation of the palpebral conjunctiva. The pupil is not dilated, but reacts to light. Its general effect is marked excitation of the entire central nervous system, followed, in toxic doses, by paralysis and death. Although the symptoms are similar to those produced by cocaine, yet this drug is less poisonous. Eucaine causes vascular dilatation, while cocaine produces ischæmia. The changes in the pupils are noted above. Clinical experiments showed that cocaine is preferable in violent inflammatory conditions of the eye, although in others the slight hyperæmic effects of eucaine will be of advantage. The latter in solution is permanent.—*Deutsche Medicinal Zeitung*, 1896, No. 34, S. 388.

### SALOL AND IODOFORM.

M. REYNIER has used this mixture, which, on heating, becomes liquid, and remains so for fifteen or twenty minutes at the temperature of the body, in irregular cavities, cold abscesses, fistulas, and bone-cavities, for the purpose of obtaining asepsis. Of late he has injected this drug in the treatment of bone-tuberculosis and filled the cavities remaining after curettage with it.

M. ROUTIER would attribute the excellent results rather to the removal of the morbid products than to the drug.—*La Semaine Médicale*, 1896, No. 19, p. 150.

### TRIBROMOPHENOL BISMUTH.

DR. E. HUESS has used this remedy for nearly three years, and has found it to be a most valuable antiseptic for wounds. This drug contains 49.5 per cent. of bismuth oxide and 50 per cent. of tribromophenol, the latter possessing a much stronger antiseptic action than phenol itself. It is readily decomposed into its constituents by strong acids and alkalies, and particularly by heat. It has a slight phenol odor, is tasteless and almost non-poisonous. When used upon external wounds and ulcerative surfaces the definite results obtained were the checking of suppuration, less sensitiveness, limitation of inflammation, and rapid healing. Fresh and non-infective wounds healed aseptically and without reaction. For burns it appeared to be equal to iodoform in quieting the pain. The explanation of its action is that the alkaline fluids found in the tissues decompose the drug, the tribromophenol then acts upon the micro-organisms, while the bismuth is an antifermentative and drying agent. In consequence of its slow decomposition a constant action is kept up and the wound is kept aseptic. Since this remedy does not markedly promote granulation, it may be necessary at first to make use of iodoform. In conclusion, it may be said that this drug is non-poisonous, odorless, tasteless, entirely non-irritating, promotes epithelial growth and lessens pain, is unchangeable on exposure to light and heat (up to 255° F.), and is powerfully anti-bacterial and anti-fermentative. It appears to be worthy of being placed by the side of iodoform, while possessing some advantages over it.—*Therapeutische Monatshefte*, 1896, Heft 4, S. 214.

### Two Cases of Heart-disease Treated by Saline Baths.

Dr. G. V. Poore states that the baths used contained four pounds of sodium chloride and six ounces of calcium chloride to forty gallons of water. The temperature of the baths was 95° F., and the time of immersion in every instance was limited to eight minutes. (1) Aortic obstruction and insufficiency; murmurs exceptionally loud. The area of cardiac dulness was invariably diminished after the bath, and both the transverse and vertical measurements proportionally decreased; the character of the murmurs was unchanged. Whether the improvement which took place was due to the rest in bed or to the bathing, or to both, is a matter of doubt. (2) Aortic obstruction and insufficiency. After each of the four baths the area of cardiac dulness diminished both vertically and transversely, and at the time the patient left the hospital the position of the apex-beat had undergone no permanent change.—*British Medical Journal*, 1896, No. 1845, p. 1139.

### The Lime-treatment of Diabetes Mellitus.

Dr. Karl Grube has treated fourteen patients with forms of calcium, generally as phosphate and carbonate. This treatment has apparently no effect upon the excretion of sugar, but the patient feels better and increases in weight. Of these patients there were young subjects who were markedly benefited. Upon the others there was no result. The treatment, however, produced no detriment.—*Therapeutische Monatshefte*, 1896, Heft 5, S. 258.

### The Therapeutics of Rheumatism.

Dr. E. H. King, basing the pathology of the disease upon deficient excretion of uric acid and possibly of other toxins, looks upon elimination as the keynote of treatment. At the outset a good dose of calomel should be followed by the saline cathartics. The most useful remedies are salicin and the salicylates. Of the first, thirty grains may be given hourly until an ounce has been consumed, and every two or three hours until the second ounce has been taken; after this the same dose thrice daily for a week or ten days to prevent relapse. The salicyl-compounds are of recognized value in relieving pain and in favoring the excretion of urea. Experience with the salicylates alone or with salophen has not been satisfactory, nor given any marked results over a generally eliminative treatment. In chronic rheumatism potassium iodide is of value as a stimulant to the glandular system, thereby promoting the excretion of urea, and by its reconstructive action tends to reestablish a physiological metabolism.—*Journal of Practical Medicine*, 1896, No. 11, p. 441.

## The Treatment of Iodism.

Dr. Briquet recommends the use of extract of belladonna, one to two grains daily, in order to avoid the nasopharyngeal symptoms. Sodium bicarbonate in dose from ninety to one hundred and eighty grains seems to benefit the general manifestations of the poisoning. There is some probability that if administered at the same time with potassium iodide the latter would be converted into the sodium salt and its therapeutic effect weakened. Sodium chlorate in daily dose of ninety grains has been recommended, but no statement is made as to its value. The employment of salol in obtaining intestinal antisepsis promised good results, but further experience has shown that the method is uncertain. Sulphanilic acid in from forty to sixty grains *per diem* will fix the nitrous acid, which, remaining in a free state, would decompose the iodide. In addition, a diet poor in nitrates, as milk, bread, and meats, should be insisted upon. Morphine possesses, as its only recommendation for this purpose, the diminution of gastric irritation. Antipyrin, besides diminishing the urine, is entirely untrustworthy. For the eruptions, antisepsis of the skin is important; baths and lotions of lime permanganate (1 : 25,000) are useful. The best method, however, is the preventive. Always commence with a small dose (seven grains), and gradually increase the amount. Large quantities of milk and even diuretics are prescribed with the drug. The fault is in this instance in diminishing its therapeutic action in facilitating elimination, which frequently is already too rapid. Of particular accidents, hemorrhage should be treated by ergotin, salivation by potassium chlorate, œdema of the glottis may necessitate tracheotomy. Frequently the symptoms which arise in its early use may disappear entirely, even if the drug be continued.—*La Semaine Médicale*, 1896, No. 18, p. 137.

Dr. Calomenopoulo found that in the case of an old syphilitic who was absolutely intolerant of the potassium salt, even when given in small doses, when ninety grains of sodium chlorate were given each day it was possible to administer forty-five grains of potassium iodide without any untoward symptoms. This was continued for about forty days.—*Journal des Praticiens*, 1896, No. 18, p. 288.

## The Therapeutics of Diseases of the Heart.

Dr. W. H. Thomson believes that the treatment must be determined chiefly by the consideration whether the affection be primary or secondary in its causation. In the treatment of primary affections the first indication is the prophylaxis of rheumatism. Particular attention should be paid to the tonsils, and prompt use of the salicylates internally should be made at the first signs of tonsillitis, together with local applications of tincture of iodine. The habitual employment of hot-water douches, with oil of peppermint, to the throat is an excellent measure. Rheumatic patients should always protect the skin with flannel, both by day and by night. Rest in bed is of great importance in the primary affections. When the symptoms are rather aggravated by digitalis, strychnine, and similar drugs, aconite will often lessen the dyspnœa, relieve the anginose attacks, and make the pulse fuller and steadier. In dyspnœa the result of adhesive pericarditis firm strapping of the right side of the chest is of undoubted service. For the dyspnœa of mitral stenosis, especially when it occurs in paroxysms, belladonna in combination with compound spirit of ether is much the best remedy. In mitral stenotic cases digitalis is often inferior to strophanthus, sparteine, or caffeine. Anæmia should always be considered, but the administration of iron is mischievous in rheumatism. In this disease the best remedies are cod-liver oil with small doses of arsenic, or calcium sulphide in from one-half to one grain doses four times daily apparently hastens the convalescence from acute rheumatism. In secondary disease of the heart one should consider the whole circuit of the circulation. The remedial agents may be divided into the constitutional and symptomatic. Of the first class, and the most important and continuous in its operation, is fresh air. Iron is the most effective among drugs, because it is our respiratory food, and has no other function in the body but as the carrier of oxygen. Next to continuous breathing in the open air is properly applied massage, especially that form in which the patient exerts a carefully regulated resistance to the flexion and extension of his muscles by the operator. The nature and seat of the peripheral obstruction which reacts upon the heart will modify the symptomatic medication. In the vicious circle of dilatation of the right heart, with resultant dropsy, due to chronic bronchitis, the heart-affection is one of the most curable if one can cure the bronchitis first. In such cases hours spent in a dry, equable air help the weakened bronchial muscles and the weakened right ventricle as well. Among medicines, tincture of ferric chloride with strychnine does more good to the cough than any cough-mixture. Here, also, arsenic and potassium iodide are useful. The most serious of secondary cardiac diseases are those dependent upon arterial disease. The rapid pulse of secondary cardiac dilatation should be treated by digitalis and not by aconite. In secondary cardiac dilatation digitalis takes the lead of all other drugs; but it should be administered with nitroglycerin, which, by dilating the arterioles, enables us to ease the heart of the peripheral obstruction, against which it had to contend before, on account of the increased arterial pressure caused by the digitalis. Digitalis also causes much gastric disturbance. When much dilatation obtains with cardiac arhythmia, general dropsy, and pulmonary œdema, the infusion in ounce-doses four times daily should be administered for two or three days; then the permanent dose of a half-grain of the powder may be given thrice daily with benefit for a long time. Prior to these smaller doses and during the administration of larger doses, calomel, in a dose of from one-half to two-thirds of a grain thrice daily, is of very great benefit; but it should be discontinued at the first signs of mercurialization. As a modification of the digitalis-treatment, equal parts of the tincture of strophanthus nux vomica, and digitalis may be given in twenty to thirty drops of the mixture thrice daily, particularly in aortic regurgitant and mitral stenotic cases. In chronic interstitial nephritis the high tension of the pulse and the low specific gravity of the urine seem to be favorably affected by small doses of corrosive sublimate. In cerebral derangements short of apoplexy both the cerebral and cardiac affections seem to be improved by a pill containing two-thirds of a grain of sparteine sulphate, one-half grain of powdered digitalis, and one-twenty-fourth of a grain of corrosive sublimate. In all cardio-renal cases with extensive dropsy a milk-diet should be avoided. Opium is a powerful heart-stimulant, and in nocturnal dyspnœa chloral is of great advantage.—*The Medical Record*, 1896, No. 1335, p. 793.

### THE INFLUENCE OF ATROPINE UPON THE RESPIRATION.

DR. UNVERRICHT notes that under the influence of this drug the respiratory volume diminishes (after the first injection 3.2 to 18.3 per cent., after the second 4.2 to 11.5 per cent.) and that later the volume rises; but this later rise is when there is exhaustion of the nervous respiratory apparatus, and this is a terminal symptom. As for the frequency of respiration, there is a striking constancy. When the respiratory volume changes it is from changes in the depth of the respiratory act.—*Berliner klinische Wochenschrift*, 1896, No. 24, S. 533.

### ANTI-TUBERCULOUS SERUM AND ITS ANTITOXIN.

DR. C. MARAGLIANO states that his serum contains specific antitoxins which neutralize, both with animals and with men, the principal toxins of tuberculosis. *In vitro* it is a bactericide for tubercle-bacilli. This is shown by heating normal horse-serum to such temperature and for such time as is necessary to destroy its natural bactericidal power. On inoculating this and the Maragliano serum with tubercle-bacilli the former shows a development of bacilli; the latter remains sterile. The preparation is as follows: The purpose is to inject into the animals which are to furnish the serum the toxic substances which can be obtained from the very virulent cultures of human tuberculosis. The first group is obtained by concentration over a sand-bath at a temperature of 212° F.; then by filtration through a Chamberland apparatus, according to the method employed for the preparation of tuberculin; this contains the proteins. The second is obtained by the Chamberland filter, the culture not being heated, and concentration in a vacuum at the temperature of 86° F.; this contains the toxalbumins and a small quantity of protein. Three parts of the first and one of the second are injected into horses in proportion to body-weight, one to five hundred thousand, and increased each day by one-half the original dose until twenty to twenty-five times that dose is reached. This maximum dose is daily injected for six months, when immunity is reached. The treatment is now suspended for three or four weeks until all of the toxic materials which have been injected are no longer in the circulation. The immunized animal is now bled and the serum prepared by the method which is used for the other therapeutic serums.—*Il Policlinico*, 1896, No. 10, p. 213; and *La Presse Médicale*, 1896, No. 47, p. 273.

### THE TREATMENT OF PHARYNGEAL TUBERCULOSIS.

DR. ROBERT LEVY believes that in the treatment of this condition especial stress should be placed upon prophylaxis. Recognizing the ease of local infection, much attention should be paid to the treatment of catarrhal affections of the upper air-tract and the proper hygiene and disinfection of the mouth and pharynx in tuberculous subjects. Maintaining a healthy epithelial surface is of much value in offering the greatest resistance to the attack. As to local curative remedies, silver nitrate (1 to 12) is of service early in the attack, when the ulcerations are few and small. Curettement and lactic acid, iodoform, and menthol in oil, have given some satisfaction. The galvano-cautery has been of more service than any other agent, both for cure and palliation. Cocaine-spray and iodoform and morphine insufflation are valuable for home-treatment. General treatment should not be neglected, while anti-syphilitic medication should be carefully followed out in cases of mixed infection. Here experience teaches us to depend upon mercury more than upon potassium iodide; the latter should be given in smaller doses and with caution.—*Denver Medical Times*, 1896, No. 12, p. 496.

### THE SERUM OF MARMOREK IN SCARLET FEVER.

M. JOSIAS has made use of two kinds of serum, the one from the sheep and the other from the horse. In the first series forty-nine children were injected with an average dose of about a drachm, with no resulting accident save some urticarial eruptions. In the second ninety-six children received from two to eighteen drachms, resulting in various complications, among which were streptococcal abscesses, lymphangitis, and polymorphous eruptions. With sheep-serum the mortality was 2.08 per cent.; with that of the horse 5.31 per cent.; whereas with the classical treatment it was 5.81 per cent. There were no serious results—albuminuria, temperature, or evolution of the disease. The serum apparently acts upon non-suppurative streptococci in contrast to its absolute failure in suppuration.—*La Presse Médicale*, 1896, No. 42, p. ccxl.

### INFANTILE TUBERCULOSIS TREATED BY THE SERUM OF MARAGLIANO.

DOTT. CESARE CATTANEO reports two cases: In the first there was distinct improvement; the fever disappeared, the weight increased as well as the amount of hæmoglobin, the liver and spleen diminished in size, and the number of white corpuscles diminished. In the second the results were much less favorable. However, these two cases demonstrate the harmlessness of the serum.—*Gazetta degli Ospedale e delle Cliniche*, 1896, No. 32, p. 331.

### THE SERUM-TREATMENT OF ARTICULAR RHEUMATISM.

DR. JULES WEISS has treated ten patients by injecting the serum obtained by bleeding patients who had recently undergone an attack of acute articular rheumatism. His conclusions can be stated only in a general way, because reaction from the injection was variable, not only for each patient, but even for each injection. This treatment cannot be said to have a specific therapeutic value, because, for all that in some cases the cure followed two or three injections of serum, in others—in fact, in the majority—it was necessary to resort to the use of salicylates. Twenty-two injections were administered. In nine cases there was an amelioration of the swelling and pain. Twice there were both subjective and objective relief at the end of three hours. In others this appeared only at the second day. In five cases there was no relief until after the second day. In six the morbid process was not at all modified, while in three there was a distinct aggravation. The quantity of serum which was injected varied from one and one-half to two and one-half drachms. In two cases only were four and one-half to five drachms used. In the three cases last mentioned an articular rheumatism of a torpid type became, after the injection, an acute polyarthritis of an inflammatory type. For comparison, in two cases of polyarthritis, injections of somatose, which contains 84 to 86 per cent. of albumose, were employed. One received three and the other two injections. These injections were followed by an immediate modification of the articular process, namely, diminution of swelling and pain. This, however, was but temporary.—*Revue de Thérapeutique*, 1896, No. 11, p. 325.

### Resorcin in Dermatology.

Dr. M. B. Hartzell believes that this drug possesses keratoplastic and decided sedative properties, the latter making it a valuable application in the large class of diseases in which itching and burning are prominent and often extremely annoying symptoms. Although supposed to be too irritating to be of use in eczema, yet in many of the milder forms it often proves extremely serviceable in allaying the pruritus and diminishing the hyperæmia; in the oozing forms, when the inflammation is not too acute, it often acts most happily in diminishing the discharge and favoring the speedy formation of cornified epithelium. Many cases of erythematous eczema will recover under the judicious use of this remedy alone. It does best when used in watery solutions of the strength of from ten to fifteen grains to the ounce; rarely is it necessary to use stronger ones. Ointments are far more apt to irritate. The addition of ½ per cent. of sodium chloride seems to increase the sedative effect of aqueous solutions, possibly by favoring the absorption of the drug by the skin. It is thus absorbed in considerable quantities, as is shown by a marked greenish discoloration of the urine, which, however, never appears unless salt is added to the solution. As a parasiticide, a paste of resorcin, two to three; lanolin, vaseline, powdered zinc oxide, and powdered starch, of each four parts, has been efficacious in the treatment of favus. The various forms of trichophytosis have been markedly benefited by an ointment containing thirty to forty grains to the ounce. Although this is not superior to other remedies of this class, it has the advantage of being cleanly. In tinea versicolor an alcoholic solution of twenty to thirty grains to the ounce may be painted over the affected area with a camel's-hair brush, nightly, until desquamation takes place. If the cure is then not complete, it may be repeated a second or third time.—*The Therapeutic Gazette*, 1896, No. 6, p. 363.

### The Effect of Exercise upon the Excretion of Uric Acid.

Dr. Edward Laval has carefully studied this much-debated question, basing his conclusions upon his observations of nine persons, differently employed, but upon the same (a mixed) diet. He believes that we should attribute the same importance to physical exercise as to the other secondary influences upon which the regular functions of life depend—such are the breathing of relatively pure air, the ingestion of a certain quantity of water, and rest of body and mind during a certain number of hours. If it were proved that exercise diminishes the excretion of uric acid, it would be logical to prescribe for gouty patients various forms of exercise—a method of treatment not likely to be successful.—*Revue de Médecine*, 1896, No. 5, p. 384.

# MEDICINE.

UNDER THE CHARGE OF

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## Presence of the Typhoid Bacillus outside of Typhoid Patients.

Remheifer and Schneider, working with Elsner's medium, have recently made a number of experiments with water, soil, and fecal material from non-typhoid subjects in order to determine whether the typhoid bacillus could be isolated from them.

Thirty-six specimens of water from different parts of the country were examined, and eight of them contained bacilli which, morphologically and culturally, resembled the typhoid bacillus. They all presented besides these characteristics the property which has been spoken of since the work of Pfeiffer as "glabrification"—*i. e.*, an animal which, under usual circumstances, would succumb to their inoculation, could be protected against them by a typhoid antitoxin. In two cases the water came from places in which typhoid was then present, and in five others typhoid had been present in the place from which the water came only a few months previously.

Ten earth-cultures showed the same bacillus six times.

Finally a bacillus identical with Eberth's bacillus was found in the stools of three individuals not suffering from typhoid (leukæmia, malaria, Bright's) and who had never had the disease. In five other patients a negative result was obtained. Of the eighteen organisms obtained from these different sources twelve were pathogenic for animals, and the animals could be protected against a fatal issue by the use of an antityphoid serum.

The authors think that these researches throw some light on the general etiology of typhoid and point to the possibility of autoinfection. They point out at the same time that there are numerous organisms which closely resemble the typhoid in all the locations mentioned, but which do not possess the property of glabrification.—*Comptes Rendus de la Société de Biologie*, July 24, 1896.

## The Urine in Hypertrophic Pulmonary Osteo-arthropathy.

Guérin and Étienne have recently examined the urine from a well-marked case of the above disease with particular reference to the quantity of lime, urea, magnesia, and phosphoric acid excreted.

The authors found that over a period of three or four months, in which they examined the urine almost daily, marked deviations from the normal were present.

The quantity of lime excreted reached to double the normal on many days over the period of four months, but after that time diminished and became less than normal. The quantity of magnesia excreted did not vary notably. The quantity of phosphoric acid has always been extremely low, and urea was present in minimum normal quantities. The authors think these examinations prove that during the first period of the disease the bony system becomes partly decalcified, and this partly explains the deformity in this disease.

The articular enlargements they explain as due to a secondary ossification following the primary process, and in which only a minimum amount of lime is excreted, as shown by their examinations.

The authors point out that this disease not only has characteristics of its own, but also has others common to itself and acromegaly (the spinal curvature), and itself and arthritis deformans (joint-deformities), and theorize as to whether it is a separate disease or a transition-stage between the rheumatic arthropathies and Marie's disease.—*Archives de Médecine Expérimentale*, July, 1896.

### BASEDOW'S DISEASE.

C. GERHARDT makes some suggestive remarks on the nature of Basedow's disease in the course of a short article on the condition of the arteries in that disease (*Mittheilungen aus den Grenzgebieten der Medizin und Chirurgie*, Bd. i. Heft 2). He calls attention anew to the pulsation of the spleen and liver, which he has observed in a number of cases, a phenomenon of importance in distinguishing between mitral insufficiency and Basedow's disease.

Gerhardt looks on the thyroid theory of the cause of the disease as inadequate. He thinks strong emotional disturbances are the most common causes. These affect the brain in such a way that vascular disturbances result. Sooner or later substances are set free in the blood, perhaps largely from the enlarged and overnourished thyroid, and these cause a principal part of the other symptoms, as, for example, the nervous ones. So it is easy to understand how removal of the gland frequently causes improvement, evidently without removing the disease, nor is it likely that organic changes can be found in the brain in a disease of this kind.

### TRICHOCEPHALUS AS A BLOOD-SUCKING PARASITE.

ASKANAZY has demonstrated that the common whip-worm does not live on the contents of the alimentary canal, as generally supposed. By a careful examination of fresh specimens he was able to convince himself that the narrow end of the worm buries itself in the mucous membrane. Serial sections show that the worm really bores its way through the mucosa, often in a tortuous manner. In the intestine of the worm Askanazy proved that the brown pigment, formerly thought to be derived from the feces of the host, gave the iron-reaction and therefore was derived from hæmoglobin. The objection that the œsophagus of the worm is too narrow for the passage of red corpuscles Askanazy showed to be erroneous. In some sections the lumen of the œsophagus had a diameter of ten millimetres. That organ is, moreover, elastic, and this, with the well-known ability of blood-corpuscles to slip through relatively narrow openings, makes it clear that there is no mechanical obstacle to the swallowing of blood by the parasite. The author found that the worms were imbedded in the mucous membrane in greater proportion in cases examined soon after death. These observations make clear the cause of anæmia in certain reported cases of trichocephalus-infection. That anæmia is not more frequent is probably due to the fact that usually only a few parasites are present.—*Deutsches Archiv für klin. Med.*, Bd. lvii. Heft 1 und 2.

## A PULMONARY VALVE WITH FOUR SEGMENTS.

VIRCHOW recently demonstrated before the Berlin medicinische Gesellschaft (*Berliner klin. Wochenschrift*, 1896, No. 30) a hypertrophied heart of unusual origin. It was obtained from a man, fifty-six years old, who had evidences of chronic endarteritis, though not to a sufficient extent to account for the hypertrophy, and at first sight no explanation was visible. Both ventricles were hypertrophied; in the wall of the right ventricle some of the trabeculæ had the thickness of a finger. The pulmonary conus was dilated, as was the pulmonary artery itself. The valves were somewhat thick, and one of them showed a curvature which must have caused insufficiency. A fourth segment was found, somewhat concealed by the others. It had its own sinus of Valsalva. This congenital anomaly with its accompanying insufficiency explained what was otherwise an "idiopathic" hypertrophy.

## BACTERIA IN THE URINE IN NON-BACTERIAL FEBRILE DISEASE.

CHVOSTEK and EGGER (*Wiener klin. Wochenschrift*, 1896, No. 30) report the occurrence of bacteria in the urine in the paroxysms of malaria and in fever produced by injections of tuberculin. As the experiments were conducted in such a way as to exclude the usual causes of error in such observations, and were positive in a greater proportion than is the case in normal subjects, the authors believe that fever serves in some way to favor the excretion of micro-organisms, though no bacterial disease in the usual sense exists. They suggest that this may be simply the exaggeration of a process which must occur at times in healthy persons. Bacteria at times gain entrance to the blood, perhaps most frequently by way of the lymphatics, and are finally excreted with the urine. These germs are probably more or less lowered in vitality, so that they cannot often be cultivated successfully, but in fevers, such as the authors worked with, the excretion is more rapid. These and other observations show that the occurrence of non-specific bacteria, especially the staphylococcus albus, in the urine cannot be looked upon as of great importance, and that other facts must be advanced in order to prove their relation to disease present.

## THE PRESERVATION OF URINARY SEDIMENTS.

GUMPRECHT (*Centralblatt für inn. Med.*, 1896, No. 30) gives a new method for the preservation of urinary sediments, which seems *à priori* to have a number of advantages over other methods. The urine is centrifugated, so as to form a compact sediment. The tubes should have bulbous extremities in order to make safer the subsequent procedures. If blood is present, the sediment, after careful decantation, is shaken up with saturated sublimate solution and centrifugated again, the sublimate decanted, and the sediment washed in the centrifuge six times with water or physiological salt-solution. After this, which may be dispensed with if there is no blood and but little albumin present, formol, in a solution of 2 to 10 per cent., is poured over the sediment, which then remains as a nubecula.

Gumprecht has preserved sediments in this way for a year with excellent results. Casts, cells of various kinds and in various stages of degeneration, red blood-corpuscles, and bacteria are well preserved and may be examined unstained or stained. Degenerated red blood-corpuscles, according to the author, are especially well preserved.

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## ANTHRACOSIS OF THE URINE.

BETZ (*Memorabilien*, xxxix. Heft 6) reports the case of a stovemaker who for a long time cleaned stoves in which anthracite coal had been burned and who acquired bronchitis. While under treatment the urine suddenly showed a black sediment which disappeared after four days. The sediment could easily be mixed with the urine, but settled rapidly on standing as a fine powder, leaving the supernatant urine clear. Chemical and microscopic examination showed the sediment to be composed of anthracite coal-dust. The sputum was free from this.

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## THE INFLUENCE OF ANTISYPHILITIC TREATMENT IN PREVENTING CERTAIN DISEASES OF THE NERVOUS SYSTEM CONSIDERED OF SYPHILITIC ORIGIN.

COLLINS publishes an important article on this subject from the clinic of Professor C. L. Dana (*The Post-Graduate*, vol. xi. No. 7). The diseases investigated were tabes dorsalis, cerebral thrombosis (exudative syphilis), syphilitic spinal-cord diseases, and general paresis, from hospital and private practice. Seventy-five per cent. of the tabes cases gave a clear history of syphilis, and in some others there was a suspicious history. Twenty-five cases of hemiplegia were selected because of the history of syphilis and the absence of other etiological factors. Out of fourteen cases of general paresis syphilis was denied in four. The other clinical details should be read in the original. The author's summary is as follows: 1. Exudative and degenerative diseases of the nervous system, due to syphilis, are most liable to show themselves at the end of the third and beginning of the fourth decade of life. 2. Thorough and prolonged administration of antisyphilitic remedies during the activity of the virus does not seem to prolong materially this time-limit. 3. Active and prolonged antisyphilitic treatment does not seem to prevent the development of such diseases as locomotor ataxia and general paresis; and cases in which syphilis is confessed and in which treatment has been most desultory and incomplete are not more liable to the earlier development or of the severe manifestations of either of these two diseases than those in which the treatment has been all it should be. 4. The administration of antisyphilitic measures in the most approved way does not fulfil the requirements of cure, and syphilis is often an incurable disease. [The number of cases seems too small to warrant some of the conclusions, which are nevertheless valuable as representing the personal opinion of the author.]

## THE SIMULATION OF OPIUM-POISONING BY ACUTE LESIONS OF THE PONS.

DANA (*The Post-Graduate*, vol. xi. No. 7) reports the following: A man, forty-nine years old, had been subject to worry and business anxieties for a long time. A year before the final disease he had a number of attacks of palpitation with anginal symptoms. Falling from the steps of a train he was struck on the back of the head, was dazed, and the next day had, apparently, an epileptic attack without paralysis. A month later he had a fainting-spell, became profoundly unconscious, with pinpoint-pupils, respiration one or two a minute, and absent radial pulse. The heart was beating irregularly at about seventy; the extremities were cold. With stimulation and artificial heat the respiration increased to four, but soon ceased entirely, very suddenly. After artificial respiration for a quarter of an hour breathing began again and at the end of five hours became normal. The pupils were normal and consciousness partially restored. Active delirium then began, lasting three days. After that ceased and the patient became rational persistent hiccough came on. There were evidences of arterial degeneration and weak heart. Had the patient died early in the attack the medical evidence of opium-poisoning would have been very strong, yet this could be positively excluded. Evidently there was acute softening or anæmia of the pons, which simulated opium-poisoning just as hemorrhage of the pons does. (The high temperature of hemorrhage was absent in this case.) Cases in which the mistake has been made are reported by Wilks, Fagge, and others. In some instances of hemorrhage the stomach has been washed out and antidotes administered.

## KLUMPKE'S PARALYSIS.

HEUBNER reports three cases of this interesting disease, all in children. In one case there was an osteosarcoma in the region of the seventh cervical and first dorsal vertebræ, with internal metastases, causing atrophy of the corresponding nerves at their exit from the intervertebral foramen. In this case there were the following symptoms: Paralysis and atrophy of the interosseous muscles of the ulnar side of the right hand, with claw-fingers; the electric excitability of the muscles reduced; no reaction of degeneration; the right eyelid and pupil narrowed; the pupil reacted well to light; the lid could be raised voluntarily. There were no vasomotor symptoms. Shortly before death paresis of the lower limbs and retention of urine, with incontinence, came on. The second case was one of caries of the seventh cervical and first dorsal vertebræ. The symptoms were much like those of the first case, but the muscles supplied by the radial nerve were involved more than those innervated by the ulnar, and gave the reaction of degeneration. In the third case there was no autopsy, but the symptoms were like those in the other two. In all three cases there was the paralysis of the arm, with the peculiar ocular symptoms. The latter are explained by the implication in the vertebral disease of the communicating branch of the first dorsal nerve, which, as Miss Klumpke showed experimentally, carries fibres from the ciliospinal centre to the smooth muscular fibres of the orbit and pupil.—*Charité Annalen*, Bd. xx. p. 280.

## CEREBRAL SPASTIC PARALYSIS IN CHILDHOOD.

H. GANGHOFNER (*Jahrbuch für Kinderheilkunde*, 1895, Bd. xl. Heft 2 und 3) calls attention to the possibility of hydrocephalus in the spastic paralysis of children, as Strümpell first pointed out. Three cases under Ganghofner's observation died of intercurrent disease. In the first case there was hydrocephalus with increased thickness of the ependyma, but otherwise no notable change. In the second case there was marked hydrocephalus with reduction of the cortex, and, microscopically, atrophy and sclerosis of the pyramidal tracts in the medulla and the cervical dorsal cord. In the third case there were imperfect development of the olfactory tracts, slight internal hydrocephalus with moderate thickening of the ependyma, dilatation of the central canal from the lower cervical region to the cauda, with thickening of the substantia gelatinosa centralis. Ganghofner explains the spastic and paretic phenomena in such cases by mild changes in the cortex or functional lack of development of certain parts, so that the cerebral inhibition of the spinal reflexes is lost.

## THE ETIOLOGY OF EPIDEMIC CEREBRO-SPINAL MENINGITIS.

Recent observations in Germany direct our attention again to this subject, and, thanks to Quincke's lumbar puncture, promise a valuable means of diagnosis.

WEICHSELBAUM described, nine years ago, an organism which he called diplococcus meningitidis intracellularis. Little attention was paid to this, the diplococcus pneumoniæ seeming to most investigators to be the cause of epidemic meningitis, notwithstanding many objections to that view. Recently JAEGER (*Zeitschrift für Hygiene*, Bd. xix.) in Stuttgart has again found the former organism in epidemic meningitis. In the spring of 1895 HEUBNER (*Deutsche med. Wochenschrift*, 1896, No. 27) found the same microbe in the fluid from lumbar puncture in a case of epidemic cerebro-spinal meningitis. Later this was confirmed by Heubner and Finkelstein in eight cases, the diagnosis of cerebro-spinal meningitis being confirmed by autopsy in all the cases except three—one of which recovered, and in the others autopsies could not be made. Comparison with Jaeger's preparations proved the identity of the organisms. Both Weichselbaum and Jaeger failed in their efforts to inoculate animals, but Heubner was more successful, and in two goats obtained positive results. The experiments showed also that the meningococcus is less virulent than the pneumococcus, thus agreeing with clinical and epidemiological observations. Pneumococcus meningitis is usually rapidly fatal, but in the epidemic disease only from a third to a half of the cases die, and of these many have a protracted course.

Important additions to the knowledge of this microbe have been made by Fürbringer (*Deutsche med. Wochenschrift*, 1896, No. 27). A young man was admitted to his wards with symptoms of meningitis and recent gonorrhœa. Lumbar puncture gave a purulent fluid, some of the cells in which contained microbes resembling gonococci. The patient died, and the autopsy revealed cerebro-spinal meningitis with an old tuberculous lesion of the lung. Examination showed that the diplococci in the meningeal fluid were in reality meningococci, the gonorrhœa being simply a coincidence.

The differential diagnosis of the two cocci was made the subject of special investigation by F. KIEFER, of Berlin (*Berliner klin. Wochenschrift*, 1896, No. 28). It is enough here to state that, although the organisms are much alike, the meningococci vary more in size among themselves than the gonococci. The arrangement in the cells is much alike in both cases. Both decolorize by Gram's method. The meningococci, however, grow rapidly in glycerin-agar—a fact of great value in the diagnosis of cerebro-spinal meningitis by the aid of spinal puncture.

Kiefer was unable to inoculate guinea-pigs and rabbits, but while carrying on his observations he had rhinitis with marked depression, headache, nervousness, and a drawing-pain in the neck. The pus from the nose showed cocci similar to those in the cultures, and these soon overcame the other bacteria of the nose, appearing almost in pure culture. Kiefer concludes that this observation shows the great infectiousness of the meningococcus; the fact that the nose is the usual entry of the microbe; that infection does not always follow a course identical in virulence with the original material; and that the meningococcus has perhaps been mistaken for the gonococcus in some cases of purulent disease of the nose, ear, and meninges—an error difficult to avoid in the absence of cultures.

## WHEAT-STARCH IN THE BRONCHI.

C. GERHARDT reports the case of a baker, working much in flour-dust, who was taken with pain in the left side, cough, dyspnœa, and pain in the thighs. There was dulness on percussion over the right apex, most marked posteriorly, increased vocal fremitus, harsh respiration, and numerous râles. The sputum had a remarkably milky appearance, like starch-paste. It was therefore treated with dilute iodine solution, in which it became blue. The microscope showed formless and cylindrical masses in the sputum, made up of round-cells and starch-granules. Starch could not be found in the nose, mouth, or larynx. Expectoration of starch persisted for two and a half weeks after the patient gave up his work. Gerhardt, who found expectoration of starch in three other bakers, suggests that the starch retained in the bronchi may have some relation to the asthma of millers and bakers.—*Centralblatt für innere Med.*, 1896, No. 20.

## THE ETIOLOGY OF GENERAL PARESIS.

From the analysis of two hundred cases in Krafft-Ebing's clinic (*Wiener klin. Rundschau*, 1895, No. 45) HIRSCHL comes to the conclusion that syphilis is the chief cause of general paresis, even going so far as to call the disease *encephalitis syphilitica.* The average age of the patients were forty-five and one-half years. Four were under twenty, two over sixty. The proportion of men to women was three to one. Heredity seemed to be concerned in 11 per cent. of cases. Psychic causes could not be discovered. (The majority of the cases were from the lower classes.) In thirteen cases there was a history of traumatism, in nineteen alcoholic excesses. Out of 175 cases with complete histories, 56 per cent. gave a positive history of syphilis, and 25 per cent. a probable history. In seventy-eight cases the period from infection to the symptoms of paresis varied from two to twenty-nine years.

### ALIMENTARY GLYCOSURIA IN FEBRILE DISEASE.

POLL (*Fortschritte der Med*, 1896, No. 13) calls attention to a fact which seems hitherto to have escaped notice, viz., that acute febrile conditions favor the occurrence of alimentary glycosuria. Croupous pneumonia seems especially prone to this, though typhoid fever, angina (tonsillar abscess), articular rheumatism, and scarlatina also furnished examples. In connection with this Poll recalls the fact that in animal experiments the liver during fever contains less glycogen than normal, even if the animals have been fed with carbohydrates, so that an insufficiency of the glycogen-depot has been spoken of. It may be supposed that part of the glucose which finds no place in the liver remains in the blood and is excreted by the kidneys. Whether this explanation holds for the clinical facts must be determined by further experiments, some of which are now making in von Noorden's laboratory.

## SURGERY.

UNDER THE CHARGE OF

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### THE PRESENT POSITION OF THE RADICAL OPERATIONS FOR CHRONIC SUPPURATIVE OTITIS.

JONES (*British Medical Journal*, May 30, 1896) makes the following classification of cases of otitis, and gives the appropriate treatment for each:

A. (1) Simple chronic purulent inflammation limited to the main cavity of the tympanum with a perforation in the membrana tensa. (2) The disease limited as in (1), but accompanied by formation of polypi unconnected with bone-disease. (3) In which removal of polypi or granulations from easily accessible parts of the tympanum or meatus reveals small superficial patches of roughened bone.

Cases of group A, except when due to tubercle, are amenable to treatment by the older methods, including curetting, properly carried out.

B. (4) Attic-suppuration, with or without caries of the ossicles.

(5) Cases originally belonging to one of the above four classes, in which adhesions between the ossicles and between the ossicles and tympanic walls interfere with drainage or cause subjective symptoms—extreme deafness, tinnitus, or giddiness.

Several cases of group B might be cited in which recovery took place without radical operation; but in the majority no permanent improvement is gotten until the ossicles are removed by natural or artificial means; in the meantime the patient is subjected to grave risk or to serious discomfort.

C. (6) Chronic suppuration of the mastoid antrum. (7) Cholesteatomata. (8) Caries of mastoid antrum or some part of the tympanic walls which, though inaccessible through the meatus, can be removed by operation without risk to important structures.

No lasting good can be done in cases of this group except by radical operation; the method best adapted to them is the so-called Stacke-Schwartze operation.

D. (9) Caries or necrosis of the petrous bone which cannot be eradicated without destroying important structures or without risk to life. It is in this and group C that tuberculous cases are usually met with.

In group D, seeing that the exfoliation of the diseased bone must to a large extent be allowed to take its own time, it is better to establish a permanent opening in the mastoid.

E. (10) Caries or hyperostosis or exostosis proceeding side by side. Unfortunately the detection of hyperostosis is practically impossible until operation is begun. Owing to the extreme hardness and brittleness of the bone and the sudden change to cancellous or carious bone, these cases can be only safely operated on with the dental burr.

The author believes that, except in tuberculous disease, cholesteatoma, and extensive caries, as much of the natural lining should be preserved as possible, as it tends to prevent dryness and is nearer the normal.

## A Case of Hour-glass Contraction of the Stomach Treated by Wölfler's Method.

Lauenstein (*Münch. med. Woch.*, May, 1896) reports a very interesting case of this rare disease operated upon, with relief of all symptoms, by Wölfler's method.

The patient was forty-three years of age, and had been complaining for some years of an obscure disease of the stomach. The symptoms were none of them sufficiently definite to make a diagnosis upon, but the condition became so serious that an operation, exploratory in part, but with the intention of relieving a pyloric stenosis, was determined upon. The incision disclosed the stomach adherent by its lesser curvature to the liver and divided into cardiac and pyloric pouches by an hour-glass contraction. The adhesion to the liver was severed and the two sacs made to communicate by a gastro-anastomosis. The patient made a complete and uncomplicated recovery, all the symptoms subsiding, and the patient regained her normal health and weight.

The most marked differential diagnostic symptom was the vomiting of small quantities of water when the attempt was made to wash out the stomach, because of the smallness of the cardiac end of the stomach. The occurrence of so small a stomach is of great rarity, except with carcinomatous disease, and, where this is absent, should lead one to consider the chance of hour-glass contraction.

## THE OPERATIVE TREATMENT OF FRACTURE OF THE PATELLA.

In discussing the results obtained in the treatment of this fracture by various methods WHITE (*Annals of Surgery*, 1895, No. 5) gives the following as the results which he has obtained by the use of Barker's method, which he has used in a considerable number of cases:

"I have not invariably succeeded in getting bony union, but have done so in the great majority of cases, and have never had any extensive separation of the fragments. My average results as to shortening the time of treatment and as to the functional usefulness of the joint later have been far superior to any I had obtained before adopting this method. The patients have never had the least after-trouble, and in no case has there been suppuration, or fever, or even marked pain.

"The operation is easy and simple, and can be done in a very few minutes. The lower fragment of the patella is steadied by the finger and thumb, and a narrow-bladed knife thrust into the joint, edge upward, in the middle of the ligamentum patellæ at its attachment to the lower fragment. Through the wound thus made a stout-handled pedicle-needle is thrust into the joint behind the lower fragment, and pushed up behind the upper fragment and through the quadriceps tendon in the middle line as close to the border of the bone as possible, the upper fragment being forced down and steadied. When the point of the needle becomes apparent beneath the skin the latter is drawn upward and incision made upon the needle, the eye of which is then threaded with sterilized silk and the needle withdrawn, carrying the thread behind the fragments. The needle is next unthreaded and passed through the same skin-wound below and out of the upper wound, but this time in front of and close to both fragments. Here it is threaded with the upper end of the suture and withdrawn. The two fragments are then brought together, friction is made to displace clots or other foreign material, and the ligature tied tightly over the lower border of the patella. The two ends of the ligature are cut short and the wound closed. A posterior splint and figure-of-eight bandage are applied. Passive motion may be begun on the tenth day. The patient may get out of bed wearing a light plaster-bandage at the end of the third week. Good use of the joint may be expected in from eight to ten weeks or earlier."

## THE ACTION OF STERILE INJECTIONS OF STREPTOCOCCIC AND SAPROPHYTIC TOXINS UPON THE HUMAN ORGANISM, ESPECIALLY UPON TEMPERATURE AND TOXIC HERPES.

FRIEDRICH (*Langenbeck's Arch.*, Bd. l. Hft. 4; *Berlin. klin. Woch.*, 1895, 49) summarizes his observations as follows:

I. Sterilized virulent cultures of streptococcus longus produce, when injected either subcutaneously or parenchymatously, a fever which begins at the end of four hours and at the end of twelve hours has reached 104° F.; a similar dose given forty-eight hours later raises the temperature to only 100.3° F. The action of the poison is, *cæteris paribus,* dependent upon the resistance of the particular individual and the grade of his immunization to the particular poison. A culture most virulent for animals produced in man an almost reactionless senility. Filtrates produce similar effects to cultures, only in a less marked degree.

II. A sterilized mixed culture of streptococcus longus and bacillus prodigiosus in a 1 to 300 solution, a dose harmless for mice, guinea-pigs, and rabbits, produced a severe intoxication. On the other hand, the filtrate from the same cultures was very weak in its action, even less as far as the fever went than the pure streptococcus filtrate. It is, therefore, probable that the proteids which accompany the living bacteria are responsible for the injurious action on man.

III. After the injection of the sterilized mixed culture herpes facialis was observed seven times, sometimes extending over large areas, appearing in thirty to fifty-eight hours and after the fever. In five cases there were paræsthesias in the part involved, with pain on pressure in the supraorbital nerve, and in two cases pain after the drying of the vesicles. In the vesicles staphylococcus pyogenes aureus was found three times, and evidence that they have nothing to do with the etiology of the vesicles.

## Asepsis in Catheterization.

Grosglik (*Cent. für Chir.*, 1896, No. 1) says that the mechanical methods employed for the sterilization of catheters are entirely inadequate. Complete sterilization can be obtained by the action of hot air at a temperature of 130° C. for one hour, or under steam-pressure for fifteen minutes. Metal catheters may be sterilized in boiling water; but the author cautions against the use of soda in the water, as particles remain attached to the catheter and produce irritation in the urethra.

Strict asepsis should be observed both in the patient and the operator; the meatus and external genitalia should be carefully washed in sublimate solution.

The greatest difficulty, however, is experienced in disinfecting the urethra. The mucous membrane is the seat of numerous forms of bacteria and they are difficult to dislodge. Disinfection is necessary in all acute and chronic infections, in which there is complete or incomplete retention of urine or in which there is hyperæmia or lesion of the vesical mucous membrane.

To procure this sterilization a pint to a pint and a half of sterilized water should be injected gradually into the urethra, care being taken to make the outflow easy so that the water will not enter the bladder. The posterior urethra can be disinfected only in conjunction with the disinfection of the bladder.

Frank (*Cent. für Chir.*, 1896, No. 4) disinfects the different kinds of catheters in formalin-vapor; he hangs them up in a glass cylinder having a sieve-like bottom which fits over a dish containing formalin-pastels. The catheters are completely sterilized after the lapse of twenty-four hours. The use of the catheters disinfected in this manner produces no harmful results.

## THE QUESTION OF POSITION IN THE TREATMENT OF FRACTURES OF THE LOWER END OF THE HUMERUS.

POWERS briefly reviews the question of the proper position of the elbow in fractures of the lower end of the humerus (*Medical Record*, New York, 1896, vol. xlix. No. 18), and supplements his views with those of Drs. Frank Hartley, B. Farquhar Curtis, and W. W. Van Arsdale. The total number of cases recorded by these gentlemen is 650. Powers concludes as a result of this collective study that "it is our opinion that the best results are obtained by treating the limb in the flexed position, and that the general practitioner will find the greatest degree of satisfaction in following this form of management."

The opinions in detail are:

HARTLEY and WOODBURY (*Roosevelt Hospital*). (*a*) Internal condyle—gypsum-splints from fingers to shoulder, forearm semiprone, elbow at right-angle; (*b*) external condyle—the same as the internal, except that the forearm is supinated; (*c*) transverse or T-shaped gypsum-splint from fingers to shoulder or with shoulder spica, forearm supine, elbow at less than a right-angle.

CURTIS (*Chambers Street Hospital* and the *Vanderbilt Clinic*). Plaster-of-Paris bandage from fingers to axilla in most cases; occasionally, when the superficial soft parts are impaired and need watching, a removable dressing with a wooden or tin splint. In the great majority of cases the limb is put up with the elbow inside of a right-angle, but not actually flexed, as the latter position would be less comfortable. The hand is in semipronation. When the "carrying-point" is lost and it is difficult to restore it, owing to the slipping of the fragments, as usually occurs in fractures of the internal condyle, the limb is put up in full extension and supination, with particular attention to the "carrying-point" for about two weeks, by which time the liability to lateral angular deformity has disappeared, and yet union is not so solid as to render it impossible to correct any outer displacement which might interfere with flexion. Then ether is again given, the elbow flexed inside of 90°, and a plaster-splint applied, with careful attention to the position of the fragments. This splint is left in place until consolidation is complete.

VAN ARSDALE (*Good Samaritan Dispensary*). In all cases flexion to 90° or to 80°; starch or pasteboard dressing until the swelling abates; then the same or plaster-of-Paris for three or four weeks, according to age (until union is complete).

POWERS (*Chambers Street* and *New York Hospitals*). "I have put the limb up in plaster-of-Paris at about 90° when first seen, except in those cases in which a tendency to "gunstock" deformity was apparent. In these latter instances I have made the angle 135° for ten days or two weeks, reduction being made under an anæsthetic, with careful attention to the 'carrying-point,' and then changing the angle to 90° or to 80°. I am convinced that the extended position is not necessary to the obtaining of suitable coaptation of the fragments, and I am by no means sure that a moderate degree of cubitus varus is prejudicial to the usefulness of the limb, though I do not know that I am prepared to go quite so far as does Mr. Robert Jones, of Liverpool, who says that neither it nor cubitus valgus is of any consequence from either an æsthetic or a functional aspect."

# OPHTHALMOLOGY.

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## Œdematous Neuritis of Intracranial Origin.

H. Parinaud (Paris) thus designates choked disk or papillitis occurring with brain-disease, and argues (*Annals d'Oculistique*, vol. cxiv. No. 1) that optic neuritis of intracranial origin is primarily a lymphatic œdema of the nerve. This œdema is produced by the same influences and the same mechanism as the œdema in the cerebral substance, of which the optic nerve forms a sort of orbital prolongation. It is most frequently combined with hydrocephalus and the increase of intracranial tension which accompanies it, but it does not necessarily imply the existence of ventricular hydropsy. Furthermore, the excess of intracranial tension seems to be incapable alone of producing papillary œdema.

William F. Norris (*University Medical Magazine*, vol. viii. No. 6), calling it papillitis, says that most investigators are inclined to the view that it is a local inflammation of the intraocular ends of the optic nerves, caused by infiltration of the head of the nerve with infected serum. This fluid passes down between the pial and dural sheaths of the nerves, carrying with it ptomaïnes, bacilli, and tumor-elements, which, owing to neoplastic or to degeneration processes in the intracranial growth and its vicinity, have found their way into the subdural and subarachnoid spaces; and which, accumulating at the distal ends of these lymph-channels, cause an infectious and symptomatic inflammation.

The accumulation of serum, probably infected, in the tissue of the head of the nerve and around it has been demonstrated in many autopsies, but the infectious nature of the infiltration is, he believes, only positively proved in those cases in which tubercle-elements and bacilli have been found in the intraocular end of the nerve.

## Treatment of Ophthalmia Neonatorum.

Dr. Vignes (Paris) (*Le Progrès Médical*, 1895, No. 28) agrees in the general verdict as to the superiority of silver nitrate as a local application, and thinks that other measures, often used with it, should be omitted. The insufflation of powdered iodoform, while an excellent modifier of tuberculous suppuration, lacks influence in this affection; and its use after the application of silver nitrate may cause the production of silver iodide, which is extremely caustic. As a cleansing-solution he prefers potassium permanganate in the strength of 1 to 4000. It seems to have a specific action on the affected membrane, markedly superior to that of boric-acid solutions. Solutions of carbolic acid exert a very deleterious effect upon the cornea. The cleansing-solution should, in any case, be used as hot as it can be borne.

### TEMPORARY AMBLYOPIA FROM CHOCOLATE.

CASEY A. WOOD (Chicago) reports (*Medical Record*, vol. xlviii. No. 24) the case of a physician, aged fifty-four years, of gouty habit, for which he had exercised great care in his diet, especially as to alcoholic drinks. He suffered from severe headaches, closely resembling migraine, beginning with a rotating mass, devoid of color in front of both eyes, which gradually increased in size and density until the whole field of vision was covered, and he became practically blind. For ten minutes even the largest objects could not be perceived. There was merely ability to count fingers at a few inches. Then the outline of large objects began to loom up, and in a half-hour smaller objects were visible; in three-quarters of an hour to an hour the vision was as good as ever. This was always accompanied by vertigo, intense nausea, severe pain and sense of pressure in the head. He had been variously treated for eye-strain and general ailments, and the attacks were attributed to many causes. Some ten years before he had found that by refraining from sweetmeats he could lessen the number of attacks. At last his suspicion was attracted to chocolate, and subsequent observation, extending over a year, proved that it was always chocolate that induced the attacks. He had since found that he could eat sweetmeats not flavored with chocolate with impunity. He could also drink coffee or cocoa, but chocolate in any form promptly provoked a seizure.

### ACUTE CONTAGIOUS CONJUNCTIVITIS.

The occurrence of acute conjunctivitis, apparently by contagion, has long been noted, and some ten years ago J. E. WEEKS described, in connection with such cases, a special form of bacillus which has since been recognized by others. VICTOR MORAX and G. W. BEACH (Paris) have recently made an extended bacteriological and experimental study of the subject (*Archives of Ophthalmology*, vol. xxv. No. 1). They give the disease the title of Acute Contagious Conjunctivitis, and find it characterized by the presence of the special micro-organism which has received the name of Weeks's bacillus.

It is always contagious—frequently epidemic. The symptoms, which vary in severity, begin two or three days after infection, with gluing together of the eyelids on awaking in the morning, and small, yellowish masses at the base of the lashes. There is increased lacrymation, congestion, and turbid discharge. It usually begins first in one eye, but affects both in its course. There are burning pain and the sense of a foreign body; the lids are swollen and discolored; and the eyeball is of a rosy tint, which has given the affection the name of "pink-eye." The symptoms continue to increase for two or three days, and frequently a slight coryza arises.

The disease runs an acute course, recovery being usually complete in two or three weeks, although some cases continue several weeks or even months.

It is more severe in adults than in children. In severe cases there may be marked purulent discharge and slight chemosis, and the cornea may become involved. The prognosis is, however, quite favorable. It should be treated by applications of nitrate of silver of the strength of 1 to 40 or 1 to 50, weaker solutions being less effective. The bacillus is found by a microscopical examination of the discharge, with a one-twelfth immersion objective. The cultures of it are best obtained on five-tenths per cent. agar, the tubes being corked to prevent evaporation from the surface, or in a mixture of human serum with peptonized agar. The bacilli are devoid of movement. Inoculation on animals of different species gave results constantly negative. Inoculation of a culture on the human conjunctiva produced a typical attack.

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### Use of Sutures after Cataract-extraction.

C. H. Williams (Boston) has used a suture in the conjunctival flap, and reports (*Boston Medical and Surgical Journal*, 1896, No. 16) eleven cases with favorable results. He makes his incision in the periphery of the cornea, inclining the edge of the knife slightly backward and cutting out with very gentle pressure, leaving a small flap of conjunctiva attached to the cornea. After the extraction of the lens this flap is united to the ocular conjunctiva by from one to three sutures of fine sterilized black silk. This secures the advantage of a conjunctival flap without any risk of its becoming rolled up or included in the wound; and lessens the danger of subsequent hernia of the iris or vitreous prolapse.

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### The Correcting-glass for Presbyopia.

E. Landolt (Paris) calls attention (*Archives d'Ophthalmologie*) to the defect in the rule often given for the choice of glasses, for near work, in presbyopia. This rule is to give the glasses which will bring the patient's near-point to a certain fixed distance, commonly 22 cm. or nine inches. Where considerable power of accommodation remains the glass that does this may not be sufficient. After the power of accommodation is almost or entirely lost the working-point is brought up to the focal distance of the glass, which is quite too near for persons that have good visual acuity. The better way is to base the presbyopic correction upon the distance from the eye at which the work is to be done, making the strength of the glass such that at this distance not more than two-thirds of the accommodation will be called into play.

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### Light-perception in Diagnosis.

R. W. Henry (Leicester) from a careful study of the light-perceptive power in 203 eyes, finds that it is not a constant quantity, but begins to diminish after the age of thirty years, and most markedly after sixty years. He says (*Ophthalmic Review*, vol. xv. No. 172) that eyes with hyperopia of over 4 D. have diminished perceptive power. In disease it is most diminished where the retina is most affected, either by pressure or a poisoned condition of the blood.

In cases of amblyopia with normal fundus (or at most with slight pallor of temporal side of disk) and central color-scotoma, if the light-perceptive power be normal, the case is probably one of toxic amblyopia; if the visual field be full, nicotine is the determining cause; if spirally contracted (a "retinal exhaustion" field), alcohol is the predominating factor. In both cases the prognosis is good as to ultimate recovery; in the former it may, and probably will, take months; in the latter, weeks.

### A New Method of Treating Pterygium.

Anton Coe (Washington) has found that by destroying the apex of the pterygium the growth undergoes rapid atrophy. He reports (*Annals of Ophthalmology*, vol. v. No. 2) two cases, one of thick and one of thin pterygium, in which, under cocaine, the apex of the growth was touched with a platinum-probe heated to redness. After this cauterization the vessels supplying the growths disappeared in a very few days. The vessels themselves were not touched in either case, the action of the cautery being confined to the apex of the growth. He thinks this an ideal operation for pterygium.

### Episcleritis Periodica Fugax in Young Persons.

Sidney Stephenson (London) calls attention to the fact that this condition, recently described by Fuchs (see page 107, January number), occurs not infrequently in children. He reports (*Medical Press and Circular*, March 18, 1896) two cases occurring in girls of from nine to fourteen years of age. These cases had—the first, seven attacks in eighteen months; the second, eight attacks in five and one-half years; the third, eleven attacks in less than three years; the fourth, five attacks in two years; the fifth, eight attacks in less than one year; and the sixth, two attacks six months apart. The last patient was still under observation; others had been lost sight of, perhaps still subject to such attacks.

### Choroidal Hemorrhage following Cataract-extraction.

J. A. Spalding (Portland, Me.) reports a case (*Archives of Ophthalmology*, vol. xv. No. 1) of this kind, and gives a very full bibliography of previously reported cases. The accident is by no means so rare as has been thought. Over fifty cases have been reported, and probably many remain unpublished, in the dread of publishing an accident which may seem to be due to a badly performed operation; but the names of the surgeons to whom the accident has occurred show that it is due solely to the diathesis of the patient. The chief cause is, undoubtedly, the atheromatous condition of the vessels, or an abnormal tension of the eyeball, suddenly reduced by the incision of the cornea and the outflow of aqueous. When it occurs the best treatment is to raise the patient's head, to relieve the pain, and to watch the eye carefully, prepared to perform enucleation as soon as possible. It does not occur more frequently with iridectomy than after simple extraction.

# DERMATOLOGY.

UNDER THE CHARGE OF
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## The Etiology and Histology of Parasitic Sycosis.

Ullman has recently published the results of a clinical, bacteriological, and histological study of eight cases of this affection (*Wiener klinische Wochenschrift*, 1896, Nos. 18, 19, and 20). As the result of his investigation he agrees with Sabouraud as to the existence of an ectotrichal form of trichophytosis in which the elements of the fungus remain in the hair-sheath without entering the substance of the hair. In all the cases except one the form of fungus was that described by Sabouraud as *tricophyton mégalosporon pyogène du cheval à culture blanche;* in two of the cases other micro-organisms were present (staphylococci). Differences in the extent and intensity of the affection are to be explained by different degrees of virulence of the organism; by varying sensitiveness of the skin, according to age, race, locality; the chemical reaction of the sweat; cleanliness; neglect of the skin. In one of the cases studied small vesicles filled with serum and pus were present, together with large patches deprived of epithelium and covered with pus and crusts, so that the case was regarded as an impetigo contagiosa until the microscope revealed the presence of fungus. The author believes there are two kinds of impetigo which clinically resemble one another, the one due to the trichophyton, the other to staphylococci.

The histological changes which accompany the process begin with the entrance of the fungus into the hair-follicle. Inflammatory changes occur in the parts around the follicle, evidently through the action of toxins formed by the fungus. There arises first a cellular infiltration in the tissues around the follicle, a perifolliculitis, which in the beginning consists chiefly of mononuclear leucocytes; later, increasing numbers of polynuclear leucocytes appear, which penetrate the internal and external root-sheaths. In this way the cavity of the follicle becomes enlarged and its walls thinned and finally destroyed. The suppuration of the hair-follicle leads not only to falling out of the hair, but to destruction of the sebaceous glands belonging to the follicle. A remarkable feature of the whole process is the remote effects of the presence of the trichophyton in the follicle, which can only be explained by the supposition that the fungus forms a toxin which produces inflammation in the follicular tissues. Another remarkable feature is the presence of giant-cells. All the cases were due to the same fungus, and the author believes this fungus capable of exciting suppuration without the intervention of other micro-organisms.

## ACUTE PEMPHIGUS.

In a paper based upon the study of seventeen cases PERNET and BULLOCH present the following conclusions (*British Journal of Dermatology*, May and June, 1896):

1. There is a group of rare cases of acute bullous eruption, accompanied by severe constitutional symptoms, and generally terminating fatally, which affects butchers.
2. The disease follows a wound of the hands or fingers.
3. It is probably due to a micro-organism.
4. The same etiological factors are probably at work in another group of very similar cases, in which the patients are brought into contact with animals or dead portions of animals.

## THE ANATOMICAL CHARACTERS OF DUHRING'S DISEASE (DERMATITIS HERPETIFORMIS).

At the séance of June 11, 1896, of the Société Francaise de Dermatologie et de Syphiligraphie (*Annales de Dermatologie et de Syphiligraphie*, 1896, No. 6), LEREDDE made a further communication concerning his researches upon the alterations of the blood and of the skin in dermatitis herpetiformis. In the examination of the blood and the contents of the vesicles and bullæ the following technique is employed: A drop of blood is placed upon the slide and spread out into a thin layer by drawing another slide over it. After it has dried it is fixed in alcoholic ether and dried again. It is stained by Meyer's hæmatin for five minutes, washed, and then passed rapidly through the following solution: eosin, 1; alcohol, 100; orange, 1; water, 100; mix.

Leredde maintains that, while eosinophilia may be found in other diseases, it is not associated in these with the excretion of eosinophilous cells by the skin; it is the union of these two which is characteristic of Duhring's disease.

## CHRYSAROBIN AND CHRYSOPHANIC ACID.

In a paper read before the Dermatological Society of Great Britain and Ireland (*British Journal of Dermatology*, July, 1896) DR. WALTER G. SMITH considered the chemistry and therapeutic properties of these two substances. Chrysophanic acid does not stain like chrysarobin, and is scarcely at all irritating; but the comparative experiments made with the two substances in the treatment of psoriasis lead to the conclusion that the former is not an efficient substitute for the latter in the treatment of this disease.

## SOME ARSENICAL PREPARATIONS AND THEIR EMPLOYMENT IN DERMATOLOGY.

DANLOS, seeking to replace the ordinary pharmaceutical preparations of arsenic with others less irritating and poisonous, has experimented with the metalloid arsenic, with the sulphuret, and with cacodylic acid (*Annales de Dermatologie et de Syphiligraphie*, 1896, No. 6). The first of these was administered suspended in honey, in a daily dose of 15 to 30 centigrammes. Given in psoriasis it produced very manifest improvement and finally disappearance of the eruption without any untoward effects. The sulphuret was likewise successfully employed in the treatment of psoriasis. Cacodylic acid was experimented with because it is said to be non-toxic, and, on account of its solubility, readily absorbable. It was administered in daily doses of 25 centigrammes, and was perfectly tolerated, while it produced the usual therapeutic effects of arsenic.

### The Origin of Pelade.

In the fourth memoir **Brocq** presents the following conclusions (*Annales de Dermatologie et de Syphiligraphie*, 1896, No. 6):

The initial stage alone of ordinary benign alopecia areata is microbic. As soon as the peladic patch becomes smooth, microbes can no longer be found, neither in the skin nor in the follicle. In the beginning of the disease almost all the follicles are infected with innumerable microbian colonies belonging to a single bacillary species always the same.

In benign cases the follicular infection is transitory; in chronic or total alopecias the same microbe is found constantly, with the same localizations.

The invariable presence of this microbe wherever there is a beginning peladic lesion gives it a value other than that of an ordinary secondary infection. However, this micro-bacillus, notwithstanding certain differences of form, cannot be distinguished with absolute certainty from the microbe which Hodara has described as the bacillus of acne. If the bacillus of Hodara and that of alopecia areata are the same, it remains to learn why in every case of alopecia this secondary infection is constant, and what role it plays. If they are different, they must be differentiated experimentally. Finally, they may be the same bacillus which, under different vital conditions, may or may not secrete a toxin capable of producing alopecia.

## OBSTETRICS.

UNDER THE CHARGE OF

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### Retained Placenta through Contraction of the Internal Os.

**Gottschalk** (*Berliner klinische Wochenschrift*, 1896, No. 21) reports two cases of this complication of labor, as follows: Each patient had borne a full-term child, labor being characterized by vigorous pains. No considerable bleeding followed the expulsion of the child. On examination the internal os was found so tightly closed that a finger could not enter. Under chloroform-narcosis the fingers were introduced and a small, thin placenta found high up in the uterus and firmly attached to the uterine wall. There was no especial difficulty in removing the placenta, and the patients made an uninterrupted recovery.

On studying the causes for the placental retention Gottschalk considers the abnormally small, thin placentæ (seven months' placentæ), the situation of the placentæ (high on the posterior uterine wall), and the prompt, firm contraction of the uterus as the best explanation for the complication. The children were full term and well nourished.

### INFANTILE SYPHILIS.

COUTTS (*British Medical Journal*, 1896, No. 1843) gives the results of his studies on this subject, summarized from the Hunterian lecture:

Regarding parental influence in infection, he finds a syphilitic mother much more potent in infecting than a syphilitic father. As far as prognosis in treatment goes, it makes no difference whether the father or mother is the infecting agent. In syphilis by conception the mother's entire or partial immunity is caused by the production of antitoxins in her body which increase with successive pregnancies.

Marasmus and congenital atrophy of the secretive and absorptive surface of the intestinal tract are considered among the most important symptoms of inherited syphilis. While first symptoms commonly appear in the second month, they may be delayed twelve months. Visceral disease (enlargement of spleen and liver) was found in most cases. Bone-lesions were less often observed; pain was often absent in syphilitic epiphysitis; suppuration was rare, usually seen in the long bones in children old enough to walk. Acquired syphilis is always accompanied by a chancre, followed by roseola and often sore-throat.

COUTTS calls attention to two propositions embraced in Colles' law—one that the mother of an infant with inherited syphilis cannot acquire it from the infant; the other, that such an infant would infect a healthy wetnurse. COUTTS has found inherited syphilis very feebly contagious, while acquired syphilis is actively so. In practice the only limitations he would place on nursing would be that the mother or wetnurse should have no excoriations on the nipples and that no ulcerations or fissures be present on the mouth of the infected infant.

### CÆSAREAN SECTION.

In the *Medical Chronicle*, 1896, vol. 5, No. 4, SINCLAIR reports the case of an unmarried woman who had hip-joint disease, was greatly deformed, had lost an eye, and had very defective teeth. She was in labor, the membranes unbroken. She was delivered by cœlio-hysterotomy, without turning out the uterus. The womb was sutured and a drainage-tube placed at the lower angle of the abdominal wound. The patient made a gradual recovery. No evidence of syphilis was present.

In discussing the case SINCLAIR states that the uterus was not removed because the conservative operation is safest and best. He considers it unnecessary to assign his grounds in reporting this or any individual case.

[The method of treatment employed in this case is open to discussion, although the operator may decline to consider any but his own methods worthy of consideration. In view of the patient's physical and social condition and the success of cœlio-hysterectomy with intrapelvic treatment of the stump, it is not easy to appreciate the wisdom of what is called a conservative procedure, which preserves the patient's reproductive powers to expose her to another abdominal delivery. The employment of the drainage-tube in an aseptic abdomen, with aseptic surgery, is not the best usage at present. The treatment employed seems to have been conservative only in its adherence to methods belonging to a period long since passed in the development of obstetric surgery.—EDITOR.]

### THE EXAMINATION OF THE ABDOMEN DURING THE PUERPERIUM.

In the *British Medical Journal*, 1896, No. 1856, MCCANN gives his results in the study of involution. His method consisted in measuring with a tape-line from the middle of the fundus uteri to the pubes, taking this at the same hour and with bladder and rectum of the patient empty. Septic cases were excluded. In 37 primiparæ the uterus was found in the true pelvis in 29 before the thirteenth day. In 21 multiparæ the womb had entered the pelvis in 13 before the thirteenth day.

Conditions which favored prompt involution were full-term labor, involution being delayed after premature labor; normal or excessive length of labor; and the parity of the patient, as after repeated labor involution is slower. Contrary to what is commonly held, McCann could not find that lactation furthered involution, but rather predisposed to anæmia, which delayed it in many cases. Women who had no secretion of milk whatever often had the most complete involution. Prolonged lactation produced super-involution, a distinctly pathological condition. He also observed that involution proceeds most rapidly during the first week of the puerperium. After-pains, in these cases, had no effect on involution, but are abnormalities in involution, caused either by retained clots or placental remains or without known cause, resembling dysmenorrhœa.

### OVARIAN PREGNANCY, REMOVED INTACT.

In the *Lancet*, 1896, No. 3804, OLIVER reports an interesting case of advanced ectopic pregnancy. An effort was made to obtain a skiagraph by exposing the tumor to the Roentgen rays for thirty minutes, but without success. On opening the abdomen the tumor was found to have a distinct pedicle, which was ligated and the entire mass removed. It proved to be the right ovary, which had become a closed sac containing fœtus and appendages. After adhesions to the intestine had been separated its removal entire was a simple matter. The patient made a good recovery.

### SYMPHYSIOTOMY FOLLOWED BY PUBIC FISTULA.

In the *Monatsschrift für Geburtshülfe und Gynäkologie*, 1896, Band iii. Heft 4, HEINRICIUS reports a symphysiotomy in a woman whose first labor ended by craniotomy. The second was terminated by symphysiotomy, which was uncomplicated. The patient's recovery was retarded, however, by a fistula which led to the symphysis, and opened near the mons veneris. This resisted treatment, and was accompanied by necrosis of the severed bones. Complete recovery finally occurred, with firm union at the pubis.

## Injuries and Operations on the Genital Organs during Pregnancy.

Villa (*Annali di Ostetricia e Ginecologia*, 1896, No. 4) reports two interesting cases of tear and chronic inflammation of the cervix uteri in pregnant patients. One was treated by amputation of the cervix, with a good result in curing the local disease and without interrupting pregnancy. In the other reflex disturbances were so severe that abortion occurred, although the local treatment was limited to glycerin-tampons and lotions. He reports, also, a case of simple suture of a torn cervix during pregnancy, without abortion.

## Epithelioma of the Pregnant Uterus.

In the *Medical Chronicle*, May, 1896, Sinclair describes a very interesting case of epithelioma of the cervix in a pregnant patient, which was not diagnosticated in the early stages, although the patient was in the hospital. When first examined by Sinclair the ulceration was so shallow that it was hoped that the disease could be entirely removed, and operation was urged. As a first step the uterus was emptied, after which the patient felt so much improved that she refused further treatment. When she finally returned ulceration had become extensive and the tissues about the uterus were involved. After vaginal hysterectomy the patient remained for some time in excellent health, but finally died of a return of the disease. The case was a remarkably favorable one for cure, had early diagnosis and treatment been possible.

## One Hundred and Five Labors in Patients with Contracted Pelves.

In the *Archiv für Gynäkologie*, Band 51, Heft 3, Knapp gives the results in 105 labors in patients with contracted pelves. These labors occurred in the Prague Clinic, in a sum total of 4289 labors during four years.

Pelvic contraction is not so frequent in Bohemia as in some other countries; flat and justo-minor pelves are most common; rhachitis was present in more than half the cases. But 8 cases of osteomalacia were seen in the 105. The skeletons of primiparæ with contracted pelvis were less heavily developed than in other cases.

During these labors uterine contractions were, as a rule, good. Premature rupture of the membranes was much more common than in normal cases.

As regards treatment, induced labor gave no mortality for mother or child, with a morbidity-rate of 50 per cent. for mothers.

The use of forceps resulted in mortality of *nil* for mothers, and 17.7 per cent. for children. The morbidity-rate for forceps was 5.8 per cent. for mothers and 17.6 per cent. for children. Version gave no mortality and morbidity for mothers and 23 per cent. mortality and morbidity for children. Embryotomy was followed by no maternal morbidity or mortality. Cæsarean section resulted in 10 per cent. mortality for mothers and 30 per cent. for children. The mothers had also a morbidity of 10 per cent.

Symphysiotomy (one case) was followed by good result. The entire series of cases resulted in a maternal mortality of 95 per cent., with morbidity of 3.81 per cent. For the children the mortality was 31.43 per cent., with a morbidity of 13.33 per cent.

In general, operative treatment was followed by a low maternal mortality, and a comparatively high fœtal death-rate. As regards morbidity operative treatment was far more successful with the mother than expectant treatment, while for the child the reverse was true. The low maternal and high fœtal mortality of the 105 cases was obtained by following the rule to regard the mother's interests as paramount over the child's. [It is not difficult to understand such a result when the mother's interests are alone considered. It is quite possible, however, that operative treatment (symphysiotomy especially) in some of these cases might have lessened fœtal mortality without increasing maternal risk.—Ed.]

## PÆDIATRICS.

UNDER THE CHARGE OF

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### The Diphtheroid Stomatitis of Infants.

Beco (*Archives de Médecine expérimentale et d'Anatomie pathologique*, July, 1896, p. 433) describes under this name a disease which, though unrecognized, has been often confused, especially by the Germans, with aphthous stomatitis. Seven cases were observed during the course of an attack of scarlatina. In five of these cases the staphylococcus pyogenes aureus was found in pure culture in the membrane, in one the streptococcus pyogenes, and in the last the same organism with some colonies of the staphylococcus albus. In four of the five cases having the staphylococcus aureus impetiginous lesions were present on the face. Six other cases from an outpatient service were observed, only one of which showed the golden staphylococcus. Of the others, two exhibited the streptococcus pyogenes with the staphylococcus albus, and three presented the same organisms together with the micrococcus tetragenus.

From a study of these cases the author describes diphtheroid stomatitis as a discrete localized affection of the buccal mucous membrane. Its seat of preference is upon the middle of the lower lip, upon the dorsum and borders of the tongue, more rarely upon the gums. He has never seen it upon the inner aspect of the jaws or upon the soft palate. These points of election are precisely those which are most directly in contact with objects which are carried to the mouth. The lesion presents itself as a plaque rising above the surface of the mucosa. These plaques vary in size from that of the head of a pin to that of a centime-piece, yellowish to grayish-white in color, the surface sometimes smooth, sometimes reticulated. In shape they are usually oval, though sometimes circular or polycyclic when two or more have coalesced. They are adherent to the subjacent tissue, and can be detached with a little force, leaving a grayish or reddish surface, irregular and bleeding slightly. The affection is scarcely painful, is accompanied by slight glandular enlargement, sometimes by exaggerated salivation, and rarely by fetor of the breath. These plaques appear without preceding vesicles, as in aphthæ; once formed they do not increase in size, unless several neighboring plaques coalesce. In the natural process of healing the exudate disappears, leaving a healthy ulceration which heals, forming a slightly depressed cicatrix. The natural termination is in cure at the end of from eight to fifteen days, which may be hastened by cauterization with the silver-stick. The affection is, therefore, parasitic and may be caused by several microbes, especially the staphylococcus pyogenes aureus and the streptococcus pyogenes. When once these organisms have produced diphtheroid plaques the affection is capable of being transmitted by contagion.

## Night-terrors Treated by Music.

Bestchinsky (*Vratch*, 1896, No. 2, p. 49) has tried the effect of instrumental music in calming the night-terrors of a child three years old. The child awoke every night in a terror that could not be allayed by any of the ordinary means. The author advised that a piece of music be played in his hearing, choosing one of Chopin's compositions (Valse Brillante, No. 2). From the first evening the child slept without awaking. After some days the treatment was interrupted and night-terror recurred. It was prevented by resuming the treatment for a time. The cure was definitive after several months. Equally satisfactory results were achieved by this treatment in the hands of Dr. Berberoff, a friend of the author's.

## The Parasites of Pertussis.

Kourlow (*Vratch*, 1896, No.3) ascribes whooping-cough to a ciliated amœba already described by Deichler in 1886. It is best detected, he says, in the mucus of the early stage, before the discharge becomes purulent. The organisms are unicellular, varying in size from half that of the red blood-corpuscle to that of the white corpuscle, or even larger. One side or two opposite sides are covered with long ciliæ which are in constant motion, and give to the bodies a rapid oscillatory movement. These movements cease when the liquid under examination becomes cold, but they may be observed for a long time upon the warmed stage. These corpuscles are clearly visible even when immovable. They may be stained with Ziehl's carbol-fuchsin. In dry preparations the bodies are small, but their ciliæ remain clearly visible. At a later period, in the purulent expectoration, these bodies are much fewer and very difficult to find; but there are now present in great number small, round, highly refracting bodies, concentrically striated like starch-granules. These are of variable size, the largest attaining a diameter double or triple that of the red corpuscle. In the larger ones can be seen a strong double envelope containing protoplasm with a central ovoid nucleus and brilliant nucleolus. The smaller bodies have only a thin ring of protoplasm, so that the envelope, protoplasm, nucleus, and nucleolus give the appearance of concentric rings; they are either isolated, grouped, or heaped up in large granular cells.

### A CASE OF SCARLATINA WITH HIGH TEMPERATURE.

DEPASSE (*Revue mensuelle des Maladies de l'Enfance*, June, 1896, p. 294) records a case of scarlatina in an infant of sixteen months, which on the twelfth day was attended by a temperature of 107.5° F. Despite the use of antipyrin and cold baths repeated every two hours, this degree of elevation was maintained for seventy hours, after which the temperature slowly declined and the child made a good recovery.

### THE RÔLE OF THE STREPTOCOCCUS IN SCARLATINA.

LEMOINE (*Société médicale des Hôpitaux*, March 20, 1896) has examined the blood in 35 cases of scarlatina, 33 of which followed the usual type and 2 assumed a hemorrhagic form, one of these being fatal at the end of forty-eight hours, the other after five days. Cultures of the blood of the 33 benign cases taken at the beginning of the eruption gave no growth, and the same negative result followed cultures made during the course and after the disappearance of the eruption. In the two hemorrhagic cases alone a pure culture of streptococci was obtained, and these two patients presented large sanguineous effusions from the margins of which the blood to be examined was taken. These streptococci, as in the researches of d'Espine and Marignac, coagulated milk and produced visible cultures upon potato. The streptococcus, therefore, seems to be accidental and due to complications of the disease. In this light the hemorrhagic form of scarlatina, it appears, should be considered as the result of the passage of the streptococcus into the blood and as the expression of a secondary infection of the entire organism.

Among the complications two cases of pleurisy, one fibrinous, the other purulent, gave the same streptococcus in pure culture; one of two cases of arthritis of the knee gave the streptococcus, the other a negative result. In twenty-two cases of nephritis with albuminuria this streptococcus was found in the urine of all, the angina having been of grave character. In eleven cases in which the urine remained normal the streptococcus was found in but one.

The author's conclusions are, therefore, that in scarlatina the renal complications are secondary and are the result of a streptococcic infection; that this secondary infection of the kidney is most often the result of a special virulence of the streptococcus developed in the fauces; and, finally, that these complications may become the point of departure of accidents of the same nature capable of being propagated by contagion.

In this connection reference may be made to a bacteriological study of KEMPER (*St. Petersburg Thesis*, 1895, and *Vratch*, 1895, No. 42) who has examined 205 cases of scarlatina without finding a streptococcus in the blood except in cases assuming a pyæmic form.

## Cyclic Albuminuria in a Family.

While examining the urine of a chlorotic girl of fifteen years, Schön (*Jahrbuch f. Kinderheilkunde*, 1896, Bd. xli. S. 307) found an albuminuria which subsequent examinations showed to be of the cyclic type: Albumin appeared about 11 A.M., and reached a maximum about 3 o'clock in the afternoon, diminishing thereafter until it disappeared completely by 8 o'clock P.M., and remaining absent during the night. Recalling an observation of Heubner's, who found cyclic albuminuria in several members of the same family, the author examined the urine of two sisters and two brothers of the patient and found the same condition in one of the sisters, a girl of thirteen years, also chlorotic. Treatment of the chlorosis had no effect upon the albuminuria. Unfortunately the two patients soon passed from observation. The author asks if the cyclic albuminuria had any dependence upon the chlorosis. In this disease, as is well known, there is sometimes fatty degeneration of organs and bloodvessels which explains the occurrence of œdema in certain cases by transudation through the walls of the vessels. The appearance of albumin in the urine in cases of cyclic albuminuria may, according to the author, be produced by a mechanism similar to that causing œdema.

## Otitis in Measles.

Bezold (*Münchener medicinische Wochenschrift*, 1896, Nos. 10 and 11) has repeated the studies of Tobeitz upon the frequency of otitis in measles, and concludes with him that otitis is a constant accompaniment of this disease. This conclusion is based upon explorations of the ear in a large number of cases and upon post-mortem examinations of sixteen fatal cases.

In these sixteen cases microscopic examination of the middle ear showed the existence of otitis media. Except in one case where the exudate was found in the osseous portion of the Eustachian tube, an effusion, muco-purulent, seropurulent, or completely purulent, was found in all the cases, not only in the drum cavity, but also in the antrum and in the mastoid cells, where the latter were sufficiently developed. The mucosa of all these parts was swollen, congested, and covered with a fine network of vessels or with minute hemorrhages. Bacteriological examination of the exudate showed in half the cases streptococci, in the other half either white or golden staphylococci. The same organisms with the same frequency were found in the exudate obtained by puncture of the tympanum in cases that recovered.

This otitis appears early in the course of the disease, perhaps at the same time as the eruption and is in full development on the third or fourth day thereafter. Clinically its evolution is benign, generally without marked symptoms; perforation is exceptional, and, when produced, is followed by prompt cicatrization. Most often it requires no intervention and leaves no trace of its course, as the author has proved by comparative examinations among school-children.

The author rejects the theory of infection from the naso-pharynx, but concludes from the constancy of the lesion that it is simply a localization of the virus upon the mucous membrane of the ear, similar to that upon the conjunctiva, bronchi, and intestinal mucosa. In other words, this otitis is a sort of enanthem analogous to the exanthem of the skin.

### A Second Attack of Measles.

Gottstein (*Münchener medicinische Wochenschrift*, 1896, No. 13, p. 288) reports a case which permits of some interesting deductions concerning immunity. A girl of ten years had an attack of measles which was marked by abundant eruption, but showed very slight symptoms in the respiratory and conjunctival mucous membranes. Two years later she had the disease anew, which now presented a totally different aspect. The prodromal symptoms (fever, angina, bronchitis, conjunctivitis, and coryza) were extremely violent, and the eruption was delayed and little marked.

The author believes that the case supports the theory of acquired immunity formulated by Schleich. In the first attack the virus seemed to act especially upon the skin and but slightly upon the mucous membranes; the skin had thus become immunized. So in the second attack the poison affected especially the mucous membranes, having but little effect upon the skin previously immunized.

## PATHOLOGY AND BACTERIOLOGY.

UNDER THE CHARGE OF

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### The Pathology of Fever as bearing upon Antipyretic Medication.

Few questions in connection with the infectious diseases are of greater interest to the practitioner of medicine at the present time than the significance of the fever which so constantly forms one of their most characteristic symptoms. For centuries the accepted treatment of these diseases has been directed to "breaking" the fever, resting upon the belief that this symptom is distinctly injurious, that the major part of the danger to the patient arises from it, and that it must at all hazards be overcome. With the development of our knowledge of the bacteria and of their causative relationship to disease, more particularly as regards the manner of their action upon the body, the question has arisen whether in reality the febrile condition is prejudicial to the natural progress of these diseases toward recovery; whether, in fact, it may not be a necessary part of the reaction of the body-tissues to the poisons of the diseases, and in so far conservative. If so, its treatment by means of antipyretics may do harm rather than good, interfering with the natural progress of the disease.

For this reason the discussion of "Fever and the Value of Antipyretic Medication," which occupied a prominent place in the proceedings of the Fourteenth Congress of Internal Medicine at Wiesbaden in April last, is of unusual interest (*Cf. Centralblatt f. allg. Pathologie u. f. path. Anatomie*, vii. 1896, Nos. 8 and 9, 377). We can here touch upon only those points in the discussion having direct pathological bearing.

In introducing the subject of the value of antipyretics KAST propounded the question: "In the present state of our knowledge, what is the effect of increased temperature upon the healthy body and upon the infected organism?" In the attempt to answer this question experiments of Walther, Löwy and Richter, and Filehne are referred to, which show that animals suffering from various infectious processes do better and survive longer when kept at temperatures above the ordinary room-temperature. In Filehne's experiments animals which had been inoculated with the erysipelas coccus did worse when subjected to cold for the purpose of lowering their temperature, even though they were afterward restored to the room-temperature, than other animals similarly inoculated, which were kept continuously at the room-temperature.

Again, Müller has shown that the viability of the typhoid bacillus, as evinced by its power of multiplication, is less at fever-temperatures than at the normal body-heat; is, in fact, about 15 per cent. less. Without attaching much weight to these results of Müller as indicating an actual inhibiting effect of fever upon the growth of micro-organisms in the body, Kast nevertheless considers them important as showing that elevation of temperature incident to typhoid fever has no influence to increase the growth of the typhoid bacillus.

It is also clear that fever can have no influence upon the specific alexins, the natural immunizing agents of the body, since these substances must have been overcome before the infectious material can have obtained a hold upon the body, and consequently before the onset of fever; but the question as to the effect of fever upon the action of the specific antitoxins is different. They are elaborated by the body-cells during the progress of the disease. Upon this subject experiments by Kast and Kühnau throw some light. In these experiments animals inoculated with typhoid bacilli received afterward injections of a strong antitoxic serum and were subjected to various degrees of heat, some to the ordinary room-temperature, others to temperatures up to 41° C., with the result that the animals kept at the lower temperature died, while several of those exposed to the fever-temperature survived. Kast concludes that while the effect of the fever in these cases cannot be set down with certainty as beneficial, it is much more probable that it assists the beneficent action of the antitoxin than that it impairs it. Whether the elaboration of the specific antitoxins by the body is assisted or impeded by the fever-temperature is unknown, but it has been shown that neither leucocytosis nor phagocytosis is lessened by it.

The increased elimination of nitrogen and the decreased alkalinity of the blood observed in febrile disorders are believed by Kast to be too slight to warrant serious consideration as evidence of a deleterious effect of fever, more particularly as they are not infrequently observed in non-febrile conditions. They would appear to be in a large measure accidental concomitants of fever and quite insignificant in any discussion of its effect upon the organism as a whole.

The same may be said of the fatty degenerations of parenchymatous organs, to the frequent occurrence of which in febrile disorders Ziegler has drawn attention. They are too inconstant and too slight in intensity to be regarded as of much moment.

The inevitable conclusion, then, is that so far as our knowledge at present indicates, the danger connected with an acute infectious disease is never, or, at all events, but rarely dependent upon the fever which accompanies it. Increased metabolism and febrile dyspepsia are to be regarded as the only significant deleterious effects of the febrile state, and their influence is at best but slight. It is admitted that long-continued fever may have an unfortunate effect upon the nervous system of a susceptible patient, just how is not known, and Kast believes this to be the only clear indication for antipyretic treatment, which in such cases is best accomplished by cool baths and by the occasional use of quinine.

At the second session of the Congress UNVERRICHT took up the same subject from a somewhat different point of view, presenting our most recent conception of the condition which we designate "fever" as a whole.

Liebermeister's theory is rejected that fever is a complexus of symptoms induced wholly by the elevation of temperature and resulting from the effort of the organism to adjust itself in all its processes to the increased heat. This theory is found upon analysis to be inadequate to explain all the phenomena of fever, for, indeed, a majority of the symptoms of fever are certainly not the result of the elevated temperature, but have with them a common cause in the various toxins of the infectious principles and in their effect upon the various tissues of the body. This conception of fever is furthermore untenable for the reason that it is impossible to conceive of all the concomitants of fever as the result of any single mechanism or condition which could result from a mere increase in the body-heat. Even the elevated temperature itself may be the result of increased heat-production, of diminished heat-elimination, or of disturbance of the heat-regulating mechanism—of one or all of these factors combined.

The competing theory, that fever is a definite complexus of symptoms among which elevation of temperature is constant, is also unsatisfactory, since the clinical picture of fever is by no means constant. Many of its factors are entirely absent at times, or may play but an insignificant part in it, and this is notably the case with regard to its cardinal symptom, elevation of temperature. Furthermore, the absence of any single cause of the febrile condition in all cases points here also against the idea of an intimate relationship between the various symptoms usually classed together as evidences of fever, Centanni's theory of a single fever-producing toxin common to all the infectious diseases being rejected by Unverricht as not demonstrated and exceedingly improbable.

The conclusion is inevitable that at the present time we are not in a position to define "fever" certainly, and that if we accept elevation of temperature as its sole necessary character, we are confronted by the necessity of including in the conception of fever every rise of temperature, even such as is observed under such wholly artificial conditions as hot baths, excessive exertion, etc. And since it is impossible to define fever as a whole, Unverricht would have us discard the use of the word as indicating any definite state of the body, and would have us for the present consider the elevation of temperature incident to it as an isolated symptom merely, urging its discussion first upon its own merits, irrespectively of other symptoms which may be present at the same time, as has been done with the acceleration of the pulse and respiration, with the headache, the disordered digestion, and the other symptoms which we have been accustomed to group together in the picture of fever. After we have acquired a better understanding of the pathology of each one of these symptoms by itself we may reasonably expect to be in a position to understand something of their interrelationship.

In the discussion which followed the reading of these papers, VON JAKSCH insisted that elevation of temperature is of much less importance as a part of "fever" than the nutritional changes which are incident to it, and which result in the formation of acid compounds, thereby reducing the alkalinity of the blood and of the body-fluids.

UNVERRICHT expressed much satisfaction with the conclusions reached by Kast, reminding the Congress that since 1882 he had maintained that the injurious effect of elevation of temperature had not been demonstrated and that more recent developments have advanced much in favor of the theory that a distinctly useful part is played by the fever-heat in the combat of infectious processes. There is even clinical support for this latter view in the pneumonia of old age, in which there is usually little if any febrile elevation of temperature, for it is matter of common experience that those cases of senile pneumonia do best in which fever is present.

And Unverricht concludes that, although we may not at present be able to explain all the phenomena of fever, one thing is clear, that we should cease to regard elevation of temperature as the cardinal symptom for therapeutic attack in the infecious diseases, but that we should look upon it as a part of the natural history, so to speak, of the disease, interference with which is more likely to do harm than good in the ultimate progress of the disease.

[We are sure that everyone who carefully considers this question must agree with the conclusion of Unverricht. Every recent advance in our knowledge of the infectious diseases has made it more evident that we must regard the symptoms of those diseases as a natural reaction of the body to the infection, and that the degree of intensity of this reaction is to a very considerable extent an index of the vigor of the combat which the tissues are making against the infectious agent. Viewed thus, the grave responsibility of the therapeutist, who deliberately interferes with the natural progress of a disease which in the end tends to recovery, must be apparent. "Meddlesome midwifery" has been decried for generations. Should we not now as squarely denounce all irrational and meddlesome therapy? Our present effort should be to gain a thorough knowledge of the processes instituted by the body in its combat with infectious material. When possessed of this we may be able by radical means to aid the body to recovery; but we are sure at the start that the measures then indicated will not be such as materially interfere with the processes instituted by the body.—ED.]

## ENDOCARDITIS AS A COMPLICATION OF GONORRHŒA.

A careful review of the literature of gonorrhœa, in so far as it bears upon complication of that disease by endocarditis or pyæmia, has led THAYER and BLUMER to concur with Finger in the opinion that there are four possible modes of secondary infection of the system incident to gonorrhœa—viz., the secondary infection may be due to the invasion of the system (1) by the gonococcus itself, (2) by associated bacteria (*staphylococcus*, *streptococcus*, etc.), (3) by both gonococcus and the associated bacteria, and (4) by absorption of the toxic products of the gonococcus.—*Archives de Méd. expér. et d'Anat. path.*, 1895.

In illustration of the first of these modes of secondary infection they present the details of a new case of pyæmic endocarditis complicating gonorrhœa in which gonococci were detected in and cultivated from the circulating blood. Several cubic centimetres of blood taken from the arm vein were mixed with nutrient agar in the proportion of 1 : 3 and plated. Small colonies developed, presenting the characters of gonococci colonies, not growing on the usual media, but developing abundantly on Wertheim's special medium. The autopsy showed recent ulcerative endocarditis in which were many microorganisms having the morphological peculiarities of the gonococcus, but cultures made from these structures remained sterile. There seems to be no reasonable doubt, however, that the germs found by culture during life in the blood and those found morphologically in the heart-lesions after death were identical and that the secondary lesion was due in fact to an invasion of the system by the gonococcus.

## INGUINAL HERNIA OF ENORMOUS SIZE.

An extraordinary case of inguinal hernia is reported by M. UNGAUER in the *Bulletin de la Société anatomique de Paris*, 1896, 352. The contents of the sac weighed thirteen pounds and consisted of the entire alimentary tract with the exception of the upper portion of the stomach, the second and third portions of the duodenum and ileo-pelvic portion of the descending colon. The spleen and kidneys occupied their normal positions, as did also the liver, which was, however, greatly enlarged and extremely fatty. The pancreas was turned so that its long diameter lay in the axis of the body. Notwithstanding this great displacement of the abdominal contents there was no noticeable impairment of the alimentary function. The appetite was good, the bowels were regular, and digestion and assimilation appeared to be normal.

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# A SUCCESSFUL CASE OF REMOVAL OF A LARGE BRAIN-TUMOR FROM THE LEFT FRONTAL REGION—OPENING AND PACKING OF THE LATERAL VENTRICLE WITH IODOFORM-GAUZE.

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## History by Dr. Thomas.

E. de B., aged seventeen years, was referred to me by Dr. George Reuling on March 27, 1896, with the request that I should examine him as to his nervous symptoms, double optic neuritis being present. The young man at that time complained of having had headaches, sick stomach, and some difficulty in seeing.

His family history is exceptionally good; both his father and mother are alive and in good health; neither of them knows of any hereditary disease in their families. The occurrence of syphilis, tuberculosis, and malignant growths was especially inquired for. One brother of the patient died from an infectious fever, when a child, in Cuba. The other brothers and sisters are unusually strong and vigorous.

The patient himself is the youngest child of seven. He was a strong baby and child; had measles and mumps, but no other infectious diseases of childhood. Other than this, he has enjoyed exceptional health. He has been active and very fond of outdoor sports, at which he excelled. When about eight years old he received a cut on the head by running through a glass door. The wound was not serious, and healed quickly under a dressing applied by his father. The scar is still evident. Three years ago he was struck on the left side of his forehead by a baseball, thrown by one of his companions. He says the blow was a hard one, and that he felt badly in consequence of it for a day or two. These are the only injuries he has received that could bear any causative relation to the development of his trouble.

He never complained of headache until the beginning of his present trouble. The patient spent last summer at the seashore, and was apparently in robust health. In September, on two occasions, while shooting reed-birds, he was obliged to stop on account of severe pain in the head. He attributed the pain to the sun and the constant discharge of his gun. Such an occurrence had never happened in previous seasons. In the autumn it was noticed by his family that after an afternoon's tennis he would seem tired, spending most of the evening on the lounge.

He entered a new school and did his work satisfactorily, although he has never been an enthusiastic student. He began to have difficulty with his eyes during the late autumn, finding that if he studied much at night they would pain him. This was not very pronounced, being only sufficient to cause him to do his work during the daylight.

On December 20, 1895, he had a very severe attack of pain in the head and eyes. He was dull and somnolent, could eat nothing, and vomited a great deal. He remained in bed until Christmas-day, and even then felt badly. About this time Dr. Reuling made his first examination of his eyes, and he has kindly allowed me to use his notes, which are as follows:

*December* 24, 1895. Complained of visual fatigue after reading, and occasional frontal headaches.

*Examination.* Hm. 0.67 each. No abnormal condition. Fundus normal.

*Treatment.* + 0.67 R. L.

After the holidays he returned to school, but on January 10th he had another attack of severe pain in the head accompanied by vomiting. He was confined to his bed for a week; during this time Dr. Reuling made his second examination and then found double optic neuritis. His notes at that time are:

*January* 24, 1896. Complains of frequent headaches, slight dizziness; had an attack of nausea.

*Ophthalmic Examination.* Neuritis optica descendens partial in right, complete in left. In the right eye inner margin of disk yet normal, outer margin indistinct and considerably more peripheric; veins of this section large and tortuous. Left eye: the whole discus opticus enlarged, its periphery considerably extended; infiltration causing considerable prominence. Several of the tortuous veins show distinct thrombi; arteries slightly covered by the infiltration. Diagnosis: tumor cerebri. V. with + 0.67 D. 20/20. General vision remarkably good; reads No. II. with + 1.25 D. with each eye. Focal vision not defective.

After this attack he had no very severe headache, but was never free from more or less pain, which he localized as being above and back of his eyes. Indeed, all the pain that he has ever had has been entirely frontal, but not more on one side than the other. His mental condition was changed, and he was dull, often spending most of the day on the bed, and he was somewhat self-willed. It was noticed that at times he staggered and seemed to have difficulty in walking.

About February 25th his sister noticed that in speaking he used the left side of his face more than the right, and it had been noticed for a day or two that the left eye was slightly more prominent than the right and was somewhat bloodshot. In March he left the city for a week and was very uncomfortable; he vomited every morning when his coffee was brought to him, and had difficulty in standing or walking. For a month before I saw him he had complained of momentary loss of vision, and he gave an indistinct history of having seen double.

The examination made on March 27th showed the patient to be a tall, well-developed young man. His intelligence seemed fairly good, although he was unable to remember certain facts in the history of his disease, and often contradicted his mother and aunt, who were with him. His voice was normal, although a little loud, and there was no sign of aphasia. He was apparently able to distinguish odors.

His left eyeball was somewhat more prominent than the right, and in the inner canthus there were some superficial bloodvessels, which gave a dark appearance to this portion of the eye. The eyeballs were steady and freely movable in all directions. There was no ptosis. The pupils were moderately dilated, round, and equal; they reacted to light and during accommodation. The vision was practically normal in both eyes (20/30 in each), although he said he saw a little better with his left than with his right eye. The visual fields, tested quickly, showed no abnormality; the colors were seen in the usual order. An ophthalmoscopic examination revealed the presence of well-marked neuritis in both eyes, more intense in the left eye.

Sensation was unaffected over the face. Muscles of mastication acted well and equally on the two sides.

When the patient's face was at rest, the left naso-labial fold was more marked than the right, and in speaking the left side of the mouth was used more actively than the right. He elevated and contracted his eyebrows normally, closed his eyes well and forcibly. In elevating the upper lip the left side was drawn higher than the right, although when strong effort was made very little difference could be perceived. He puckered his lips well and was able to whistle.

Hearing was acute in both ears.

His sense of taste was unaffected.

The movements of the soft palate, pharynx, larynx, and tongue were perfectly normal. The pulse was counted, and nothing abnormal was noted.

There was no paralysis or incoördination in any of the muscles of the trunk or limbs, and sensation was unaffected. The deep reflexes were normal. The patient walked well, stood steadily with feet together and eyes closed.

Neither pressure nor percussion caused pain anywhere over the skull. The urine had been examined on several occasions, and nothing abnormal found.

There could be hardly a doubt that the patient was suffering from a brain-tumor, which fact Dr. Reuling had already told the boy's family. As there was no history of tuberculosis or syphilis either in the family or in the patient himself, the patient stating that he had never been exposed to venereal contagion, it seemed more probable that the growth was either a sarcoma or a glioma; but, to give him the benefit of every doubt, he was put on increasing doses of iodide of potassium and was directed to be rubbed every night with mercurial ointment.

The patient took the medicine very well, but there was no change in his symptoms. Dr. Osler saw him on April 10th, and confirmed the diagnosis of brain-tumor. He dictated the following note in regard to his heart and bloodvessels: "Pulse is difficult to compress; no definite sclerosis of the radial. Cardiac impulse is seen just beneath and within the nipple, better felt just in the same situation. Heart-sounds are clear at apex; first perhaps a little murmurish. Aortic second is decidedly accentuated."

Dr. Osler advised pushing the iodide and mercury.

I made urinary analyses at four different times; the first, when the patient had been taking the treatment about three weeks. At that time there was a considerable quantity of albumin. On the next occasion, about four days later, there was less albumin; the third time, only a trace; and at the fourth analysis, which was made for me at the Johns Hopkins Hospital, there was no albumin. Tube-casts were looked for at each examination, and were not found. There was never any sugar present.

On April 17th, at which time the patient was taking 80 minims of iodide of potassium three times daily, he became sick at his stomach and vomited frequently. The sickness lasted most of that day and was unaccompanied by any severe pain in the head.

This was on Friday; he was better on Saturday, Sunday, and Monday; on Tuesday he was very restless, always moving about. He took a long walk on that day. On Wednesday morning he awoke with sick stomach and vomited a good deal. At this time he was in the country under the care of another physician. When I saw him on Sunday, the 26th, he had been in bed since Wednesday. The iodide and mercury had been stopped, but the sick stomach still continued. He was dull and often somewhat delirious, having, on one occasion, endeavored to get out of the second-story window, in the middle of the night, under the idea that he wanted to go to the garden. He several times passed his urine in bed, apparently without noticing it. The sick stomach was almost constant, and he vomited nearly everything that he took. It was noticed that when he sat up in bed he would become dazed and seem to lose consciousness. At these times his pulse was said to be very weak. Once or twice, when endeavoring to drink from a cup, his right hand shook a good deal, and he was unable to raise the cup to his mouth. This disability lasted for a few moments, and he was then able to move the right hand normally. Upon examination the only change in his symptoms that I noted were the increased mental dulness; a slight thickness in speech, wrong words having been used on one or two occasions; decided loss of vision in his right eye, he being barely able to see at all with that eye; and a peculiar uneasiness of the right hand. This was constantly in motion, picking the bedclothes, drumming on the bed, etc. When asked to make any movement with that hand he performed it accurately and well. The muscular strength was unimpaired. He said that he suffered very little pain. His pulse was somewhat weak and slow, beating between 52 and 60 to the minute. Temperature was normal, and respiration 14. He was given strychnine and small doses of bromide.

*April 27th.* Dr. Reuling reported: "Vision in right eye reduced to quantitative perception of light. Left eye: fingers at twenty feet by peripheric fixation. Ophthal. stat. idem."

The exophthalmos of the left eye, the mental dulness, the slight paralysis of the right side of the face, and the peculiar uneasiness of the right hand, taken together with the absence of other symptoms, led me to the belief that the tumor was in the left frontal lobe, and I told the boy's parents of my belief and suggested an exploratory operation.

Dr. Osler saw him again with me, and urged the operation. On May 4th Dr. M. Allen Starr, Dr. Reuling, and myself saw him together. Dr. Starr's examination and opinion, which he kindly allows me to use, are as follows:

"The general symptoms and course of the case make it evident that Mr. de B. is suffering from a tumor of the brain. The existence of a right facial paralysis, a thickness of speech, of a protrusion of the left eyeball, with greater degree of optic neuritis in the left eye, and very marked change in mental characteristics and mental activity, the hebetude and indisposition to move about, with some decided instability in motion, point to the left frontal lobe as the seat of this tumor. The slowly progressive character of the symptoms, with lack of great variability in their character, and the absence of headache and tenderness on percussion, make it seem probable that the tumor is of a hard sarcomatous character rather than a vascular glioma, and make it open to operation. Such an operation is necessarily exploratory, and it seems likely that the best point for exploration will be over the second frontal convolution about its middle, the probable situation of the tumor being subcortical within the white matter of the frontal lobe, pressing backward upon the motor tract and upward toward the cortex of the posterior part of the second frontal convolution.

"It is the absence of epileptic attacks which leads specially to the idea of the tumor being subcortical. If exploratory operation is undertaken, I suggest that the method employed be that of a large bony flap, in order that the surface exposed may be as large as possible. If, after the opening of the dura, nothing is found at the spot indicated, and palpation at the bottom of the deepest fissure accessible fails to reveal any growth, I suggest that the base of the frontal lobe over the orbit be investigated, if possible, by lifting the entire lobe and exploring with the finger beneath.

"From the fact that destructive lesions of the forward tip of the frontal lobe appear to give rise to few symptoms, I think it would be justifiable to make an incision into the frontal lobe for the purpose of exploring the white matter in case the tumor is not found at either of these two positions."

After a good deal of discussion the boy's family decided to have the operation done. Dr. W. W. Keen was asked to perform it, which he did on May 10th. For a week before the operation the patient's condition remained about the same, except that vision in the right eye became entirely lost, and in the left eye began to fail, especially for near objects. In the distance he had approximately fifteen-thirtieths vision. Both pupils were dilated, but reacted to light. There was no marked change in the condition of the optic nerves. His general condition improved somewhat; he vomited very seldom, and was able to take more nourishment. The pulse varied between 52 and 70, and the temperature was normal. The uneasiness of the right hand persisted and extended to the right foot; his nurse said that she had noticed it during sleep.

## The Operation by Dr. Keen.

*May* 10, 1896. I first saw the patient to-day, and found his condition as follows: A tall, muscular young man seventeen years of age; vision was lost in the right eye, but he could read test-letters with the left. Both pupils were widely dilated, but reacted to light. The left eyeball was protuberant to a moderate extent, the upper lid having the appearance of being swollen. On the left forehead, an inch to the left of the median line and just at the border of the hair, was an irregular scar about an inch long, which was stated to have been caused by striking his head against a glass door with some force about ten years ago. No evil consequences followed at the time. It is doubtful whether this has any relation to the tumor, as the operation did not disclose any special injury to the bone either externally or internally, nor did the tumor found later start apparently at the corresponding point in the brain. Possibly the blow with the baseball may have been the cause of the tumor. His right lower face was slightly changed in expression in repose by a moderate paresis; when he smiled the paresis was very evident. I was not able to examine the skull by percussion, as he was already prepared for operation. His mental condition was rather dull; but, at the same time, he appreciated who I was and that an operation was about to be done. His speech was not very thick.

I was ably assisted surgically by Prof. L. McLane Tiffany and Drs. Martin, Lanier, and William J. Taylor. Drs. Thomas, Osler, and Reuling also were present, and advised us from time to time.

*Operation, May* 10, 1896. An incision was begun 1.5 cm. below the temporal ridge. This was extended 6.5 cm. horizontally a little more than 2.5 cm. above the upper border of the orbit to within 1.5 cm. of the median line. It was then continued posteriorly parallel with the median line for a distance of 12 cm., where it reached a point 2 cm. in front of the Rolandic fissure. From this point it passed downward nearly parallel to the Rolandic fissure a distance of 12.5 cm., which brought the termination of the line again 1.5 cm. below the temporal ridge. (Figs. 1 and 6.) This large bony flap was chiselled loose and turned downward, breaking through the bone just below the temporal ridge. So great was the intracranial pressure that when I had completed the chiselling of the bone, before fracturing its base, its internal edge was lifted above the level of the skull more than half a centimetre. The moment that the bone was reflected the dura bulged at least half a centimetre above the level of the opening. By touch it was excessively tense and elastic. Pulsation was evident. At no point over the dura was there any such special hardness as to indicate a tumor. Accordingly, in view of the early beginning-symptoms in the left eye and the possibility, therefore, that the tumor might be on the orbital aspect of the frontal lobe, I decided to explore first the inferior surface of the frontal lobe. My incision in the bone above the orbit had been purposely placed at a point high enough not to invade the frontal sinus. I now gnawed my way cautiously downward toward the orbit by the rongeur-forceps, so as to enable me to explore the under surface of the frontal lobe. The frontal sinus was not opened; but had a small opening been made in it, it was my intention to have puttied it up with Horsley's wax, so as to prevent infection. I was soon able to lift the frontal lobe sufficiently to feel the crista galli, and also to see as well as feel the curved lesser wing of the sphenoid and the dura over the temporo-sphenoidal lobe beyond the lesser wing. Had there been any reason for it, I am sure I could have seen the anterior clinoid process without difficulty. Nothing abnormal was seen on the under surface of the frontal lobe, in or under the dura. I next passed my finger under the frontal lobe, but could feel no abnormal hardness or softness. Accordingly, I decided to open the dura on the superior aspect of the brain. I made my incision parallel with the borders of the bony opening. As soon as the dura was opened the brain bulged far above its level; inspection showed a dark area at a point just above and in front of the junction of the second frontal sulcus with the precentral. This dark-colored area was evidently the tumor protruding through the ruptured cortex. (Fig. 1 ⊕.) As the tumor evidently extended posteriorly and inferiorly beyond the limits of my bony opening, I now gnawed away some bone downward into the temporal fossa and backward till my opening reached the line of the Rolandic fissure, or possibly a little back of it. Extending the incision in the dura, I was now able to see normal brain-tissues posteriorly and inferiorly, showing that the visible limits of the tumor had been reached. Four large vessels which ran toward the tumor were now tied in the peripheral normal brain-tissue. During these manipulations the rent in the cortex at the point already specified had extended anteriorly, and showed that the tumor was much larger in the subcortical tissue than on the surface. I, therefore, attempted to enucleate it, and was quite surprised to find the ease with which by three fingers I finally scooped it out of its bed, much as one would scoop an egg out of its shell with a spoon. No serious hemorrhage followed the removal of the tumor. In order to check what hemorrhage did occur I packed the cavity for a few minutes with iodoform-gauze. Meanwhile, while waiting for the hemorrhage to be arrested, Drs. Thomas, Osler, and Reuling examined the tumor carefully, and in their opinion it was a well-delimited sarcoma of rather hard texture, and

FIG. 1.

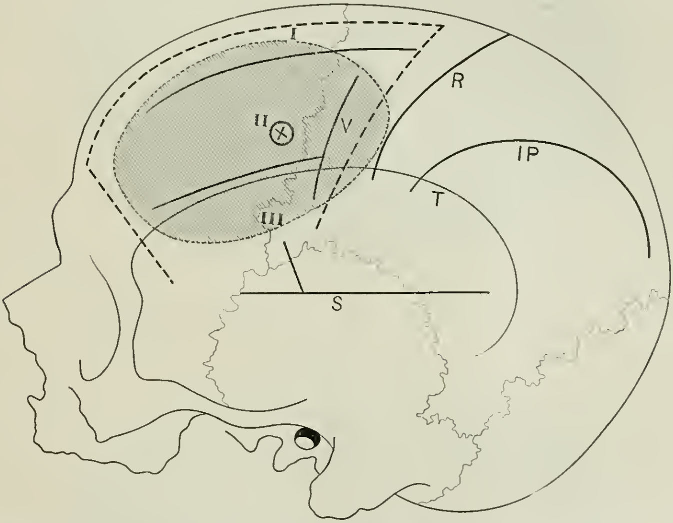


Diagram to show approximately the relations of the tumor, which is represented by the shaded area. The interrupted line represents the osteoplastic flap. I, II, and III are the three frontal convolutions. ⊕ represents the place where the tumor had broken through the cortex. R. Fissure of Rolando. V. Vertical or precentral sulcus. IP. Intraparietal sulcus. S Fissure of Sylvius. T. Temporal ridge.

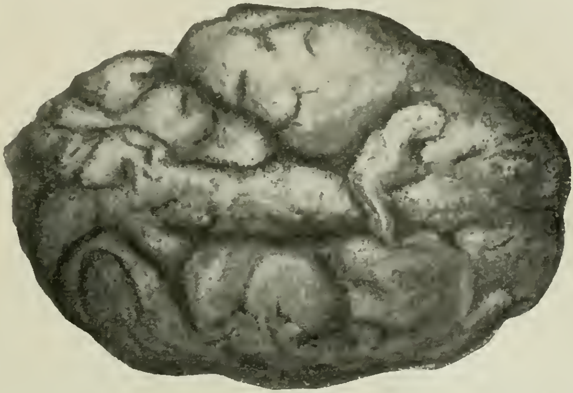
they believed that the entire tumor had been removed. I next removed the gauze-packing, and, to make sure that all the tumor was removed, I inspected very carefully the walls of the cavity in which it had lain.

These, apparently, were entirely normal; no appearance of sarcomatous tissue existed at any point. At the bottom of the cavity lay a clot as large as the end of my thumb. This, I thought, should be removed, lest it should undergo decomposition after closing the wound, and, accordingly, with a curette and finger, I lifted it out. During the removal of the tumor, I should have stated that when my fingers reached its base there was a considerable gush of fluid mingled with the blood, which I suggested came from the lateral ventricle. When I removed the clot, therefore, I was not altogether surprised at the fact that I looked directly into the lateral ventricle, which was widely open anteriorly at about the point where the anterior cornu joins the main cavity of the ventricle. I saw clearly an opening which I took to be the mouth of the middle or that of the posterior horn, though it may have been the general cavity of the ventricle. I packed a small strip of iodoform-gauze into the cavity occupied by the tumor, the end of the gauze filling the anterior portion of the lateral ventricle to prevent blood passing into that cavity. (See Remarks.) As there was now but little hemorrhage, I closed the wound, suturing the dura excepting where the gauze-drain came out, and then secured the flap in place by silkworm-sutures.

When the operation was over, although it had lasted for two and a half hours, the condition of the patient was quite as good as when he was placed upon the operating-table. His pupils had contracted to their normal size and were responsive to light. He unconsciously moved both arms and both legs before he left the table, showing that there was no paralysis. So far as his face was concerned we were not able to tell, as up to the time I left him no conscious movement of the face had been made. This was especially gratifying to me, because the tumor had evidently displaced the pre-Rolandic convolution backward and the third frontal downward. I was not able to judge well of his speech, for he only muttered a half-intelligible reply to a question I asked him before I left. His pulse was good and respiration tranquil. A culture was made from the surface of the brain and sent to Dr. Kyle, with a negative result.

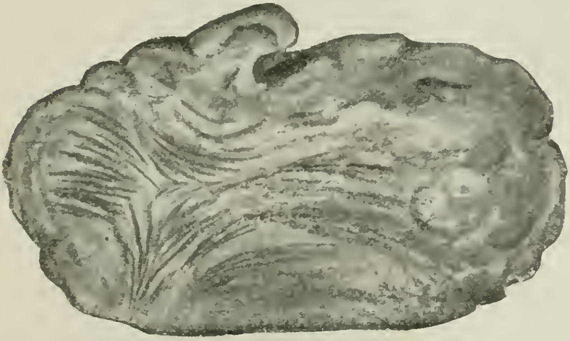
*12th.* I saw him again this afternoon with Drs. Thomas and Martin. He passed quite a comfortable day yesterday, and had not had a particle of pain, so that no opium had been given him in any form. His tongue was a little dry and coated, and for this Dr. Tiffany had ordered one-tenth of a grain of calomel every hour until the bowels were moved; an enema in the early evening gave a satisfactory movement. His temperature yesterday (the day after the operation) in the evening rose to 102.4°; this afternoon to 101.4°. He feels hungry, but has only been allowed from three to five ounces of milk every two hours. His pulse, which had been 150 after the operation, fell to 120 yesterday, and to 104 to-day. His skin is in good condition. The wound had been dressed on the evening of the day of operation, when the dressing was quite saturated, and again yesterday, when the discharge was much less. I dressed it myself when I saw him this evening, and found the dressings but slightly saturated. Both the gauze-drain, the inner end of which lay in the front part of the lateral ventricle, and a silkworm-gut drain in the forehead were removed. A very small amount of blood-stained serum escaped from both apertures. Small bits of gauze were introduced a slight distance into the two openings merely to keep the skin from uniting. The wound in every respect looked normal. Instead of the depression of the flap which existed immediately after the operation, there was distinct rounding of the head, and pressure on the flap disclosed a moderate amount of resistance underneath. He had had some bromide for sleep last night, and fifteen grains of trional were ordered for to-night. Saving this moderate rise of temperature, his condition leaves nothing to be desired.

FIG. 2.



The external appearance of the tumor. Natural size. (Drawn by Dr. J. M. TAYLOR.)

FIG. 3.



Antero-posterior section of the tumor. Natural size. (Drawn by Dr. J. M. TAYLOR.)

14*th*. His temperature in the morning has been usually a little above 99°, and to-night is 100.5°. He is hungry, has eaten an egg this morning, has had the bowels opened by an enema. His intelligence is quite marked, though he is not very talkative. He appreciates his surroundings and the gravity of the operation, and is anxious to see his parents. The pupils are again dilated, but mobile to light. His right lower face is slightly paretic, the arm and leg not at all so. There is no aphasia. The wound looks perfectly well. Slight bulging of the flap still continues. The drains are out and the wound entirely united by first intention, excepting at the two points where the drains were.

*24th.* He is out of bed to-day, the fourteenth day after operation, and able to walk about; his appetite is excellent, and he is on full diet. His temperature slowly but steadily decreased, reaching the normal at the end of a week.

The tumor was oval-shaped, 7.5 cm. long, 5.5 cm. broad, and 4 cm. deep ($3\frac{1}{2}$ inches by $2\frac{1}{8}$ inches by $1\frac{9}{16}$ inches), and weighed $2\frac{1}{2}$ ounces. The surface of the tumor was somewhat lobulated and its color darkish-gray. On section it showed a point of yellowish discoloration toward the posterior portion about its middle, from which distinct rays of tissue proceeded as from a focus in all directions.

Fig. 4.

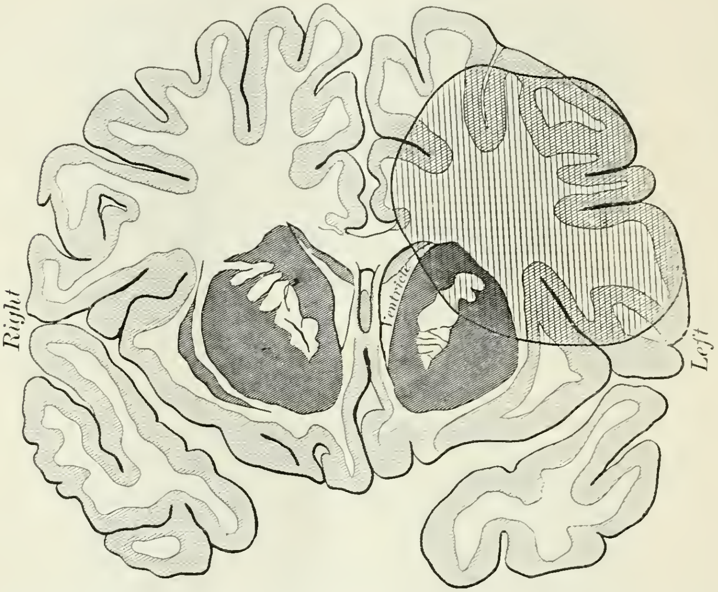


Diagram to show the depth and relation of the tumor to the convolutions and the ventricle. The shaded portion represents the tumor. (The section is from *Dalton's Topographical Anatomy of the Brain.*)

Fig. 4 shows the relative position and depth of the tumor in a cross-section of the brain, and that it involved all three of the frontal convolutions and the ventricle. The corpus striatum may have escaped entirely; but, if it was involved, it was presumably displaced rather than destroyed.

## After-history and Remarks by Dr. Thomas.

After the removal of the tumor, and the patient had recovered from ether, his mental condition was much improved. It was noticed immediately after the operation that his pupils, which were widely dilated before, were of normal size. At the first dressing it was noted that the pupils were again widely dilated, and they have remained so ever since. Since then there has been very little to note, as he had an uninterrupted convalescence. His vision has become progressively worse. Dr. Reuling's notes are:

"*May 28th* (eighteen days after removal of tumor). Right: vision almost *nil*, slight perception in extreme outer corner. Ophth.: papilla optica flat, grayish, discolored, showing proliferation of connective tissue and atrophic nerve-fibres in radiating arrangement. Arteries very thin. Left: neuritis optica degenerativa, some swelling and redness. Pupils of both eyes dilated almost *ad maximum*. No central fixation, no accommodation, and almost no reaction to light. Eserin brings on contraction and greatly increases reaction to light. Left: fingers at eighteen feet. Right: *nil*. As the patient's eyes were going from bad to worse, at Dr. Reuling's suggestion, Dr. de Schweinitz, of Philadelphia, was asked to see him. This he did on June 3d, and the result of his examination is abstracted from his letter as follows:

"I regret to say that he is entirely blind in the right eye; in the left eye his vision is eccentric, and amounts to reading very large letters at about 1 metre—actually, 1/60. The field of vision is markedly contracted, only a small patch being preserved on the temporal side. Both optic disks show subsiding neuritis, the swelling being 3 D. The vessels are shrinking, particularly the arteries, and there are here and there throughout the retinas splotches of fatty degeneration. The pupils in ordinary light are dilated *ad maximum*. They do not respond to the strongest artificial light-stimulus, but when exposed to bright sunlight, or the white light reflected from a cloud, they slowly contract to nearly their normal size, and in this same light still maintain, unstably, this contraction. This curious phenomenon, for which there is no adequate explanation, has been observed in cases of optic-nerve degeneration a number of times. There is no color-perception for even very large colored objects, red being called gray, green black; there is no attempt to name the other colors. The prognosis is exceedingly bad. The exudation into the nerve has evidently been very extensive, and atrophy of the fibres is now rapidly taking place.

"Very unusual features in this case, so far as my experience goes, are the rapidity with which the optic neuritis developed and the resulting early blindness. Clinically, it is well known that cerebellar growths are associated with papillitis, which quickly develops into that type which was at one time known as "choked disk," and in which blindness quickly takes place even before the stage of the subsidence of the inflammatory process. These same phenomena in growths situated in the frontal region, as in the present case, must be rare."

The diagnosis in this case, as has already been said, was based, first, on the general symptoms of brain-tumor combined with mental dulness, the protrusion of the left eyeball, the slight right-sided facial paralysis, and the peculiar uneasiness in the right hand and foot. The remarkable disturbances of locomotion which are often associated with tumors of the frontal lobe were present in only a very slight degree. The patient did at times complain of difficulty in walking, but this was not seen during any of the examinations, except, perhaps, when he was gotten out of bed during Dr. Starr's examination; he was then very weak, and walked in a tottering, unsteady fashion. This symptom—frontal ataxia—to which Bruns[1] has called particular attention, is of very great interest, and at times complicates the diagnosis between tumors of the frontal lobe and those of the cerebellum. The mental disturbances consisted in a general dulling of his faculties and the occurrence of mild delirium on one or two occasions. He was never guilty of making puns, nor did he indulge in witticism (Bruns: Oppenheim, *Arch. f. Psych.*, xxi. and xxii.), and, so far as was evident, he had a proper appreciation of his personality.

The unilateral exophthalmos which assisted in the diagnosis is not easy to explain, as it is generally believed that the intracranial pressure is the same throughout the skull-cavity; it may possibly have been due to some local disturbance of the circulation. The condition has persisted since the operation, but is less marked.

*October 1, 1896.* Patient was seen to-day. He states that he has passed the summer without any symptoms referable to his head. He has been perfectly free from headache, and seems in excellent health and spirits. The scar is hardly noticeable on his forehead. There is no longer any exophthalmos of the left eye, and the muscles of the face act equally on the two sides. He thinks that the vision of the left eye has improved somewhat, but he is still unable to see sufficiently well to walk alone.

It is interesting that after such an extensive destruction of the left frontal lobe that there should be so few symptoms; indeed, except for the slight remains of the paralysis on the right side of the face and the symptoms referable to his blindness, the boy seemed perfectly normal. The functions of the frontal lobes have always been a fruitful field for speculation, but they have become especially interesting at this time through the recent experimental work of Bianchi, of Naples, and particularly so through the brilliant investigation and deductions of Flechsig.

Bianchi (Winter, *Brain*, 1895, p. 497), experimenting on dogs and monkeys, believes that he has arrived at definite conclusions. He determined the limits of the excitable areas by electrical stimulation, and extirpated all of the lobes in front. When one frontal lobe was removed, he very generally noticed some motor symptoms during the first week or two, but after this time the animals seemed to be perfectly normal. The motor symptoms consisted in rotary movements (the truncal concavity being toward the mutilated side) and a paresis of the opposite arm for delicate movements. In all the animals he was able to demonstrate visual disturbances, consisting in an inability to recognize objects in the temporal half of the visual field of the opposite eye. Thus, if the eye on the mutilated side was closed, the animal would walk and run about without ever coming in contact with objects placed in his way; but if his attention was fixed, and some food of which he was very fond was brought into the field of vision from the temporal side, it was not noticed until it was in a line with the visual axis, when it was quickly seized and eaten. When the eye on the operated side was tested, the animal grasped the object as soon as it came within his visual field. The visual disturbances lasted for two and sometimes three weeks.

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[1] Bruns: Deutsche med. Wochenschr., 1892; and Real-Encyclopädie (Eulenberg), 1895, Bd. viii. p. 663.

Bianchi found, when he extirpated but one frontal lobe, that there was no discoverable change in the animal's behavior, or psychical manifestations, but that when both lobes were removed the animals were very markedly changed. They became inert, dirty, forgot their playmates and friends, and were indifferent as to what they ate, etc.

Bianchi believes that the whole nervous system takes part in the formation of the psychical personality, and that there is no such thing as a centre for intelligence. Still, he insists that these phenomena which he has observed after the destruction of the frontal lobe must be accounted for. His hypothesis is "that the frontal lobes are the seat of coördination and fusion of the incoming and outgoing products of the several sensory and motor areas of the cortex. . . . The frontal lobes would thus sum up into series the products of the sensori-motor regions, as well as the motive states which accompany all the perceptions, the fusion of which constitutes what has been called the psychical tone of the individual."

He attempts no explanation of the curious visual disturbances.

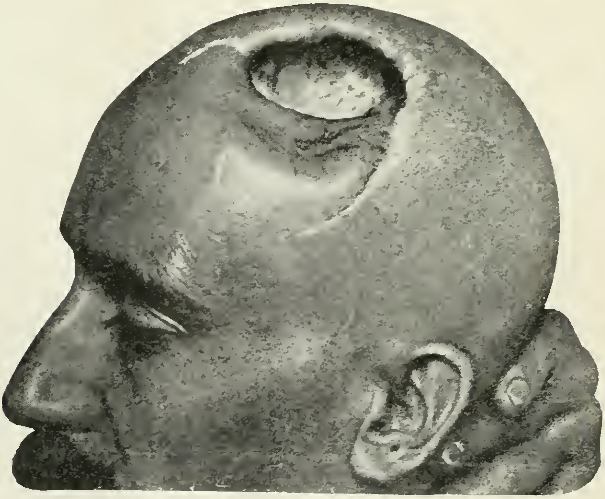
Flechsig, in his recent address, "Gehirn und Seele," and particularly in the notes which he has just now published with the second edition, gives the result of many years of work upon the appearance of medullated fibres in the developing brain. The tracts which connect the cortex with gray masses below, the so-called projection-fibres, develop early, and first of all those which serve for the conduction of sensory impulses. By the study of many brains in different stages of development he has been enabled to mark out accurately the different sensitive areas, among which, it may be remarked, that he includes what we commonly call the motor region. Between these sensitive areas are regions in which no projection-fibres either enter or leave the cortex, but in which he has been able to trace fibre-tracts from the different sensitive areas; these regions he has designated association-centres, and he thinks that it is upon their development that the intellectual power of the individual depends. He prophesies that, by careful study of the intellectual activity of normal and diseased individuals and a thorough anatomical investigation of their association-centres, we will be able to arrive at a scientific basis for the localization of these mental characteristics.

He thinks that he has already been able, in cases of general paresis, to explain the peculiar symptoms by the areas which are involved in the morbid process. Flechsig's association-centres are what have been called the silent areas of the brain; but we are forced to believe that they are silent, not because they do not speak, but because we are too dull of understanding to hear what they say. The frontal lobe corresponds to Flechsig's anterior association-centre. In this region, although no projection-fibres reach the cortex, a band of such fibres does run in the white matter of the lobe, and, turning back, enters the cortex of the somatic sense-area (körperfühlsphäre), which includes what we commonly know as the motor area of the cortex. It may be that it is the involvement of this tract which is the cause of the motor symptoms, the paresis, and the ataxia. Flechsig has demonstrated that the cortex of the lobe itself is in connection with the olfactory centre and with the somatic sense-area, and probably with the other sense-centres, and he believes that we have stored here the memories upon which the idea of individuality of the person depends. It will be seen that the views of Bianchi and Flechsig in regard to the function of the frontal lobe agree fairly well.

## REMARKS BY DR. KEEN.

SIZE AND WEIGHT OF THE TUMOR. The present tumor is the second largest I have ever removed. The largest and my very first modern brain-operation was done on December 15, 1887; therefore, nearly nine years ago (THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES, October, 1888). That patient I saw recently. His appearance two years ago is

FIG. 5.



Result seven years after the removal of a large fibroma of the brain.

seen in Fig. 5. His eyesight is quite imperfect. His epileptic attacks occur at intervals of about a year. He is still, however, very nervous and unable to do any work.

In that case the tumor, a fibroma, measured two and seven-eighths by two and one-half inches and one and three-quarters inches in thickness, and weighed 3 ounces and 49 grains. The present tumor, therefore, is nearly as large, but is much less in weight, because of its different character. Pasting on the skull a piece of paper which shows the size of the present tumor, it is seen to occupy the second frontal, encroach on the first, and practically to occupy nearly all of the third frontal convolution and very largely the area of the pre-Rolandic convolution. In fact, I judge (though the surgical exigencies of the moment did not allow me to determine it absolutely) that the tumor extended all the way back to the fissure of Rolando. It is another illustration of even how direct as well as distant pressure is compatible with but very slight symptoms. That there was no more marked aphasia is surprising.

It is also extremely gratifying to observe that the mechanical injury done to the rest of the brain in removing the tumor and the later necessary pressure from swelling and accumulation of wound-fluids, a swelling so marked as to lift the flap very distinctly above the level of the scalp and to make it quite tense to the touch, were not followed by either any increase in the aphasia or in the motor paralysis of the face, and did not produce any paralysis in the right arm or leg.

At least seven tumors larger than the present one and one equally large have been removed from the brain.

First, the largest tumor of all by Bramann, nine ounces, followed by recovery. (*Annals of Surgery*, 1892, vol. vi. 378.)

Second, Bramann, five and a half ounces; recovered. (*Annals of Surgery*, 1892, vol. xvi. 378.)

Third, Durante, the size of an apple; recovery. (*Lancet*, October 1, 1887.)

Fourth, Weir, five and a half ounces; died. (*Medical News*, April 16, 1887.)

Fifth, Horsley, four ounces; result not stated. (THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES, April, 1887, 362.)

Sixth, Czerny, nearly seven ounces; died. (*Beitr. klin. Chir.*, 1894, xii. 107.)

Seventh, Keen, three ounces and forty-nine grains; recovery (*loc. cit.*).

Eighth, Starr and McBurney also reported the removal of a tumor which was a little longer, but not quite so wide as the present one, measuring three and a half by two inches; died in eight hours. (*New York Medical Record*, January 21, 1893, 87.)

Ninth, the present case.

It will be seen that of these nine large tumors weighing from two and a half to nine ounces, four recovered and four died, while in one the result is not stated. It would seem almost as if large removable tumors were scarcely more dangerous than small ones.

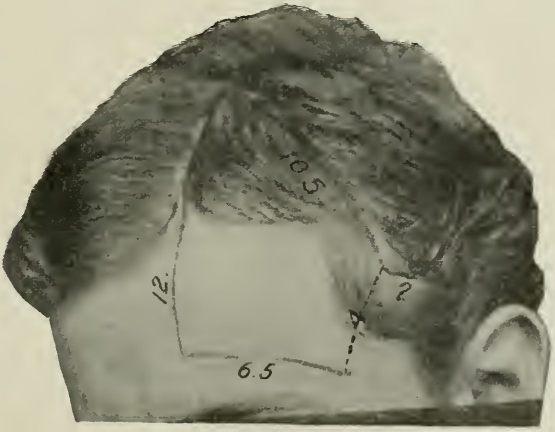
Mode of Access. The osteoplastic flap which I raised was the most extensive resection of the skull I have ever done. I have not quite reached the point in audacity of Doyen, of Reims (*Rev. de Chirurgie*, 1895, p. 900), who advocates and has practised the removal of one entire hemisphere of the skull. He even declares that cerebral localization in future is only of physiological interest and is not necessary to the surgeon. I was, however, very much pleased with the extensive view of the brain which I got, a view which in this case was needful to the proper treatment. It was desirable that the orbital surface of the frontal lobe should be examined. This is the first case in which I ever had occasion to examine it, and I was very much struck with the ease of access and the extensive view that I had. Should it have been necessary to open the dura before lifting the frontal lobe, I think there would have been no difficulty in seeing the pituitary body and the vessels. At the best, manipulations here would have been, however, of course, much more dangerous than on the free surface, by reason of the relative inaccessibility. If in future I should have a case in which an extensive frontal operation is necessary, I should make, if needful, an osteoplastic resection of the whole forehead, either in one piece or bilaterally in two. There would be no difficulty, of course, in separating the superior longitudinal sinus from the skull after the first flap had been resected and drawn back.

Removal of the Tumor. Fortunately, the tumor was not an infiltrating sarcoma, but well delimited. As in my case of the large fibroma above alluded to, I was able to scoop it out with perfect ease, because of its lying loose in its bed. The hemorrhage after the enucleation was very much lessened by the prior ligation of the vessels connecting the tumor with the cortex at the point where it had broken through the cortical layer.

Prognosis. The apparently non-infiltrating character of the tumor, which was confirmed by Dr. Flexner's examination, would also lead us to take a much more hopeful view of the future of the patient, as to non-recurrence of the growth. As it may take, however, some years to determine these facts, it seemed desirable to report the case at once and then supplement it at a later period. It is encouraging to remember that in Durante's well-known case a fibro-cellular sarcomatous tumor the size of an apple was removed from the left anterior lobe, and in spite of its character the patient was in good health four years later.

Opening and Packing of the Lateral Ventricle. This is the first case in which I ever have actually looked into the lateral ventricle in the living, and, so far as I know, is the first in which the ventricle has ever been packed. The entire cavity was disclosed, so that I could see certainly into the cavity and possibly into the opening of the middle or posterior horn. In view of the free opening and, of course, of the gradual oozing of blood which would take place after the flap was replaced, I was fearful lest the blood might flow from the lateral into the third ventricle and then through the Sylvian aqueduct reach the fourth ventricle, where any pressure would be excessively dangerous and possibly fatal. This accident, I discovered later, actually occurred to Horsley, and the patient died from pressure on the respiratory centre from the blood which reached the fourth ventricle from the lateral (*British Medical Journal*, 1893, ii. 1367). For a moment I hesitated, I confess, to place any packing in the ventricle; but I thought that this would be less dangerous than allowing the blood to accumulate in that cavity, and so I packed rather lightly a strip of gauze a little over an inch wide and several inches long into the anterior part of the ventricle and the adjacent part of the bed in which the tumor had lain, thus shutting off the ventricle, and brought the other end of the gauze through the incision in the scalp. It drained very well, and after forty-eight hours was removed. The amount of cerebral spinal fluid to which it gave exit was not very large. The dressing had to be changed the same evening, and again on the next day. It was but slightly saturated on the third day, and by the fourth, two days after the drainage was removed, was scarcely soiled at all.

FIG. 6.



From a photograph four months after the operation. The figures are in centimetres.

The facts proved by this case as to the bolder surgery of the lateral ventricle which may be indulged in with impunity, are very encouraging for the future.

That the patient made so admirable a recovery is largely due to the extremely kind and careful attention of Dr. Tiffany and his assistant, Dr. Martin, as well as, I may add with propriety, to the discreet judgment of my colleague, Dr. Thomas.

Fig. 6 shows the present appearance of the scar (Sept. 1, 1896), four months after the operation.

### Microscopical Examination of the Tumor by Dr. Flexner.

" The specimen is in two parts which can be more or less closely approximated. Besides the sides, which had been united and present uneven surfaces, the external surface generally has a lobulated appearance. This does not, however, resemble to any great degree the convolutions of the cerebral cortex. Adhering to a portion of the mass are shreds which are taken to be portions of the cerebral membranes.

" Müller's fluid has been employed as the hardening-agent, and the specimen is well hardened and preserved. For the purpose of the histological examination portions were removed from several situations, including a portion of the tumor to which the membranes adhered. A separate piece of membrane was also studied.

" On making the incisions for the purpose of removing pieces for microscopical examination it was noticed that not infrequently small, whitish or grayish-white, opaque foci occurred at variable distances, but usually not more than 5 to 6 mm. below the surface. As it was desired to preserve the specimen the incisions were not carried entirely through the tumor. The impression obtained, however, was that these patches became more numerous in the deeper parts. They were irregular in shape and averaged about 2 mm. in width and several in length.

" The tissue was imbedded in celloidin, sectioned, and stained in Upson's carmine and Mallory's phospho-molybdic and hæmatoxylin stains. The stained sections were examined in Canada-balsam and glycerin.

" The tumor is composed of cells, intercellular substance for the most part fibrillated, strands of fine fibrils and bands of coarser ones. The latter consist of homogeneous connective-tissue bundles carrying many bloodvessels.

" The greater part of the tumor is made up of cells, which, however, are not scattered uniformly over the field, but are collected into more or less definite groups, some round, others oval, and still others elongated in form. The cell-groups are separated chiefly by the strands of fine fibrils described. As regards the cells themselves, they vary somewhat in form, the majority being round or oval, about the size or a little larger than the normal glia-cells; but a few are distinctly elongated, and rarely a cell two or three times the average one is met with. The larger cells are found at times to form small cell-groups or to lie two or three in one place.

" Now and again an area of the section of the extent of a dozen or more cell-groups will refuse to stain, appear pale and granular, or perhaps a stained cell here and there will stand out in sharp contrast to the remainder. These places correspond with the opaque and degenerated spots already mentioned. They are composed of cells, fragments of cells, granules, and fibrils. The cells which do not stain are indistinct in outline and irregular in size. The few staining-nuclei belong to leucocytes.

Not infrequently red blood-corpuscles, outside of vessels, are present intermingled with the other elements. The intercellular material is also more or less indefinite, chiefly irregularly granular, but at times showing a few fibrils.

" The non-degenerated portions of the tumor are much more uniform in appearance and structure. They consist of groups of cells, as described, separated by bands of fibrils. The cells, it is true, are not sharply cut off from the fibres, for now and again the same cell-forms are found lying among the fibrils in the peripheries of the groups. The individual cells in the groups are separated from each other by single or small clusters of fine fibrils which often appear to be continuous with the thicker strands separating the large groups. In these portions very little only of the intercellular substance is of a granular nature.

" Not infrequently these fibres present an appearance suggesting a union with or origin from the cells. The elongated cells are seen to send off streaming fibrils from each extremity, and the round or oval ones appear as if surrounded by hair-like processes, or to give off a bunch from one or two sides. Moreover, a part at least of these fibrils appear to pass into the strands separating the cell-groups from one another.

" Cells having the size and form of ganglion-cells were not encountered.

" The tumor is moderately vascular, and bloodvessels are met with within the substance of the tumor, running amid the fine fibrils or surrounded by round and oval cells. These vessels are distinguished by their very thin walls and from an outer investment of fibrils such as are present between the cells. The bloodvessels in the coarser bands have thick and well-formed walls. Punctiform hemorrhages occur in the tumor, but chiefly in the degenerated areas.

" At one point of the section the meninges are still attached to the surface of the tumor, and the cells from the latter can be traced directly into the membranes in this situation. The separated piece of dura mater shows adherent cerebral cortex. It is free from infiltrations with tumor-elements.

" A small amount of coarsely fibrillated fibrin also occurs in the degenerated portions.

" From this description it is considered that the tumor is a gliosarcoma.

" It may be worth while to speak on one or two points regarding the foregoing description in the light of the more recent studies of neuroglia, especially in view of the fact that a considerable part of the tumor is composed of the so-called glia or Dieters cell. The opinion ventured by Boll (1874), that the fibres of neuroglia pass by and actually do not emanate from the cells, received later (1883, 1892) the support of Ranvier, whose well-known studies led him to regard the fibres and cells of the neuroglia as independent structures. This view, which was opposed to many of the older conceptions, was not borne out by the application of the method of Golgi to the study of the question. On the other hand, the elaborate study of Weigert (*Beiträge zur Kenntniss der normalen menschlichen Neuroglia*, Frankfort-on-the-Main, 1895), just published, has led to confirmation of the view advanced by Ranvier. Through the use of a new method of staining devised by him Weigert has succeeded in demonstrating the fibres in neuroglia independently of the cells over and next to which they may be observed to pass. He believed that he could exclude definite connection between these processes or fibrils and the cell-protoplasm. Mallory independently and at almost the same time (*Centralblatt für Pathologie*, 1895, Bd. vi. p. 753) arrived at a similar conclusion, having used a method in some respects similar to Weigert's. Mallory further found that the glia in sclerotic conditions of the cord and brain of human beings was of essentially the same constitution. Recently I have received from Dr. Mallory a specimen of glioma in which the independence of the fibres and the cells of the tumor is well shown.

"Unfortunately the method employed for hardening the tumor in this case did not suffice for the use of the staining-methods suggested, especially for the demonstration of the glia. The phospho-molybdate stain, while staining glia-elements, stains other structures as well. In view of these facts it is clear that in the description of the tumor only such appearances as could be obtained by the methods at command are given; and with respect to the ultimate question of actual union between the cell-protoplasm and fibrils no statement is ventured."

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# THE CEREBRAL COMPLICATIONS OF RAYNAUD'S DISEASE.[1]

By William Osler, M.D.,
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Raynaud's disease may complicate many affections of the central nervous system. Perhaps the most frequent disorder with which it is associated is hysteria. Case VIII. in Raynaud's original thesis is perhaps the most remarkable example on record. With the most aggravated paroxysms of pain and local asphyxia, she had hysterical convulsions, contractures, and analgesia. The literature contains a number of less aggravated examples. Levy (*Revue Neurologique*, January 30, 1895), who recently discussed the question, holds that there is a purely hysterical form, induced by emotional causes, and which may be relieved completely by hypnosis.

Raynaud's disease is not at all uncommon in asylum-cases, as noted by Southey.[2] The disease has been met with in epileptic dementia (Wiglesworth)[3] and in acute mania. Bland's[4] patient, a male aged twenty-three years, had had fits from his thirteenth year. In an attack of acute mania he stood on his feet for eight nights. The disease developed in the feet, and at the same time paroxysmal hæmaturia occurred.

Ritti[5] has reported two cases in which local asphyxia developed in the period of depression in cases of *folie à double forme*.

The disease has been noted in many chronic affections of the brain and spinal cord. There are three instances at least of the association with hydrocephalus, two of the cases in adults, and one, reported by T. K. Monro,[1] a child of nineteen months, had had from birth mottled patches of local asphyxia in different regions, and at the age mentioned developed symmetrical gangrene of the toes. There are instances also in connection with syringomyelia and with locomotor ataxia.

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[1] Read before the American Neurological Society, 1896.

[2] Quoted in Barlow's Appendix, Sydenham Society Selected Monographs, 1888, p. 193.

[3] Trans. Path. Soc. Lond., xxxviii. 1887.

[4] Lancet, 1889, i.

[5] Annales Médico-Psychologie, 1882, t. viii.

Visceral manifestations, the expression of vascular changes of a kind similar to those which produce the peripheral phenomena of the disease, are exceedingly rare. In a few instances gastro-intestinal crises and attacks of colic occur not unlike those which develop in angioneurotic œdema; but I know of no post-mortem report of a case in which changes in the organs have been found at all suggestive of prolonged local disturbance of the circulation.

Occasionally there are symptoms pointing to serious disturbances in the functions of the brain. A number of the patients have been epileptic; but with the exception of the first case, to which I shall refer, I know of no instance in which the attacks appeared to be directly associated with the development of Raynaud's disease. In Case XIX. of Raynaud's original thesis, usually quoted as an illustration, the woman had epileptiform attacks which preceded and were not specially related to the gangrene of the feet of which she died.

Our attention was directed to cerebral symptoms in the disease by a patient at the Johns Hopkins Hospital, whose case is reported in full by Dr. H. M. Thomas in Volume II. of the *Reports* (1890). I give here a brief abstract and a note of his condition subsequently to Dr. Thomas's report:

CASE I. *For six winters attacks of Raynaud's disease; attacks of epilepsy occurring only when the local symptoms were present; hæmoglobinuria.* —This man, aged twenty-six years, had had for three winters in succession attacks of Raynaud's disease, the hands and feet and ears and nose being affected. The case presented nothing unusual so far as the local condition was concerned. He had had losses of substance in the ear-tips, but not of the nose or of the fingers. The most remarkable peculiarity was the occurrence of the disease in the winter only, and the association of it with severe epileptic convulsions and with hæmoglobinuria, a symptom which has been frequently noted in the disease. The epileptic attacks occurred only in the winter, and always in association with the local asphyxia and the bloody urine. The report given by Dr. Thomas is up to January 10, 1890. The patient was in the wards on two subsequent occasions: on February 6, 1892, and March 21, 1893. In the winter of 1891–92 the ears and nose troubled him very much, and he had had blotches on the arms. Up to the date of his admission he had had no convulsions. He had had several attacks of bloody urine. We did not see him again until March 21, 1893. During this winter he had repeated attacks of discoloration of the ears, nose, and fingers, with the passage of bloody urine. On this admission he had no convulsions. He had, however, two additional symptoms of great interest, namely, attacks of severe abdominal pain, resembling colic, which recurred at intervals, and enlargement of the spleen, which could be felt 4 cm. below the costal margin. The patient has not been under observation for the past three years, and I have not been able to find his address.

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[1] Glasgow Medical Journal, 1894.

I can find no parallel case in which the epilepsy occurred only during the manifestations of Raynaud's disease.

So far as I can gather from the literature, the only instance in which aphasia developed in connection with the attacks is reported by M. Weiss.[1]

A woman of very nervous temperament was subject to most aggravated attacks of local asphyxia in the fingers, with arthropathies and superficial gangrene of the left cheek, followed by atrophy of the left half of the face; she also had patches of superficial gangrene on the buttocks. On October 8th she had suddenly disturbance of speech, with pallor, and slight cyanosis of the lips. The attack lasted fifteen or twenty minutes. On November 5th she had a similar attack. Weiss attributed the cerebral symptoms to a spastic ischæmia in the region of the third left frontal convolution.

In the following remarkable case there were recurring attacks of aphasia with transient hemiplegia. The clinical summary is as follows:

CASE II. *For five or six years occasional attacks of numbness, with mottling of the fingers. In April, 1891, an attack of dizziness and, perhaps, transient loss of consciousness; a month later a second attack, with pain and local asphyxia in the little and ring fingers of the right hand. In January, 1892, a third attack of dizziness, accompanied with asphyxia and superficial necrosis of the terminal phalanges of the index and little fingers of right hand. A fourth attack on the 2d of February, with aphasia, loss of power in the right hand, and with paresis of the right foot; rapid recovery. On March 31st a second attack of complete aphasia, with spasm in the right hand. Good health until the summer of 1894, when she had slight pain and aching in the right leg and toes. In February, 1895, local asphyxia, necrosis of terminal phalanx of middle finger of right hand. On April 4th severe attack, with headache and slight paralysis of the left arm and leg, severe local symptoms in the right hand and fingers. On July 19th a third attack of aphasia, with right hemiplegia, local syncope, and asphyxia in right hand and fingers. In January, 1896, intense pain in right hand; rapidly developing gangrene extending to the elbow; coma; death.*—Mrs. H., aged forty-eight years, admitted to Ward C of the Johns Hopkins Hospital, February 9, 1892, complaining of difficulty in speaking and of peculiar sensations in her fingers.

The family history is good. She knows of no similar complaint in any of her relatives. She is married and has had a number of children. She had one miscarriage in 1878. As a rule, she has enjoyed excellent health. In 1875 she had acute rheumatism, affecting the hands, elbows, and hips. The attack was very intense for a week, and lasted in all about six weeks. At intervals she had had slight returns of the pains in the joints. Six weeks ago she had what her doctor called rheumatic gout in the big toe. On several occasions she had had slight attacks of renal colic, and, though she has been told by her physicians that she has gravel, she does not think that she has ever passed a stone.

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[1] Wiener Klinik, 1882.

For five or six years at least she has had peculiar feelings in the fingers, a sense of tingling and numbness, chiefly at the finger-tips and on the pads; sometimes, too, in the ball of the thumb. At these times the fingers become mottled. The condition persisted usually for only a few hours, though she has had attacks in which it lasted for one or two weeks. The tingling feeling was sometimes so aggravated that she would put her hands on ice. The fingers were never blue, but on several occasions she had irregular bluish spots on the back of the right hand. The fingers never became cold and dead. The condition rather resembled that of chilblains, though she had never suffered from that complaint as a girl. During these years she never thought seriously of the condition. It was annoying, but not very troublesome. The toes were never affected.

In April, 1891, she was seized with dizziness while at the breakfast-table; a queer sensation began in the feet, spread all over her, and for a moment she lost her sight, and, she thinks, consciousness. The attacks, though of very short duration, frightened her very much. A month later she had a second attack. About seven o'clock in the morning she felt suddenly that things were moving, and she had to take hold of a chair to prevent herself from falling. She was given brandy, which nauseated her, and she vomited three or four times. The face and lips were congested, not pale; the speech was not affected. Within a few hours she felt quite well. She noticed, however, that her right arm ached very much, and at eleven o'clock she looked at her right hand and saw that the little and ring fingers were of a purplish-blue color. They remained black and painful for nearly five days, and were numb for a longer time. There was no loss of substance. She had no further attacks until just five weeks ago, when she again became very dizzy, and would have fallen had she not grasped a chair. In this attack the index and little fingers of the right hand were affected, and the doctor thought she would have lost them both, as they remained cold and black for days. The skin turned of a greenish-black color and gradually came off. The nail, however, did not come off. The fingers are now healing, and new skin is forming. In the first attack she had slight disability of the hand, which in the second attack was much more marked, so that she could not dress herself or use the hand to feed herself. She thinks, too, that the hand was somewhat swollen.

A week ago she had a third attack, which came on with much ringing in the head, particularly in the right ear. She felt very dizzy, but did not lose consciousness. Her teeth, however, chattered, and there were involuntary movements in her right hand. She had headache and saw double. She found that her right hand was almost useless. She could move it from the elbow and shoulder, but she could not hold a glass of water. On attempting to get up she scarcely could stand, and the right foot and leg were weak. For the first time the speech was affected. She could only mumble words, and could not be understood. She had no nausea and no vomiting. The difficulty in speaking and the slight hemiplegia have persisted, and it is for this condition that she seeks relief.

S. P.—The patient is a well-nourished, somewhat corpulent woman; the color of the face is good; the venules on cheeks and nose are a little dilated. The pupils are equal, react to light and on accommodation. There is no diplopia; the ocular movements are perfect. There is no facial paralysis, and there are no disturbances of the sense of taste or smell. The temperature is normal; pulse regular, tension a little increased; the vessel-wall of the radial arteries is a little sclerotic. The movements in the right hand are good, but the hand is weak and the grasp feeble. She can pick up a pin, can use a fork, and can write, though slowly and with difficulty. She says that the power in the hand has been returning rapidly within the past few days. The skin of the left hand and fingers looks quite natural. The terminal phalanx of the right index finger is of a deep bluish-red color, and the nail is deeply discolored. On the pad of the finger the skin is very dry, and there is a thick layer of old dry epidermis, which on the ulnar side of the phalanx is of a greenish tint. Over the rest of the phalanx there is new skin. The middle and ring fingers look pale. The terminal phalanx of the little finger is covered with a shining new dermis. The nail-bed is swollen, and it looks as though the nail might come off. The condition of these fingers followed the attack early in January. She says that there is tingling in the thumb and in the middle fingers, and in the palm of the hand, and they feel hot like fire. The sensation in the hands is good on both sides. All trace of paralysis of the foot has disappeared. She walked upstairs, and she now seems to walk without any dragging. There is no distinct aphasia, and she does not appear to have any difficulty in expressing ideas; but there is a hesitancy in the speech, and the articulation is somewhat stammering. She names objects at once, and she reads easily. There is no hemianopsia.

The examination of the heart was negative, with the exception of a slight accentuation of the aortic second sound. The hypogastric and right iliac regions of the abdomen are occupied by large masses, probably fibromyomata.

The urine was light yellow in color, with a specific gravity of 1023, and a faint ring of albumin with cold nitric acid; no tube-casts; no blood.

The patient remained under observation until the 20th. She improved steadily, and on leaving the hospital she spoke with clearness and without hesitation. The fingers had almost healed, and the dry, greenish skin came away from the terminal phalanx of the index finger. On several occasions there were marked hyperæmia and hotness of the right thumb, associated with a burning sensation, and on the back of the right hand a spot appeared about 2 cm. in width, which was very hot and tender.

Through the kindness of Dr. Boutelle I have been kept informed at intervals of the subsequent progress of this case. In a letter dated April 4, 1892, he says:

"Two weeks after her return from the hospital she had another attack of giddiness, not associated with any trouble in the fingers, or with loss of speech. On March 31st she had a very remarkable attack. She had burning sensations and nervous feelings in both hands, but was up and about and feeling very well. At three o'clock she was talking with some friends when she suddenly became completely aphasic. There was no giddiness. She was laid on a lounge and a messenger was sent to fetch me. I reached the house at 4 P.M. She was perfectly sensible, understanding everything, but was unable to reply. She could protrude the tongue fully and open the mouth. She seemed to know what she wanted to say, but could not express it. There was no double vision. The right hand was stiff, and at times convulsed. The attendants said that the thumb had been drawn strongly into the palm of the hand and that the hand and arm were cold. When I saw her they were warm, but the fingers and thumb had a tendency to spread and to become stiff. About 6 P.M. the power of speech began to return, and when I saw her the next day she talked as well as before the attack. There were one or two small discolored spots here and there on both hands, not associated with any pain, or with any threatening of gangrene as was formerly the case in the fingers."

Dr. Boutelle informs me that from this date until the summer of 1894 she remained well, having no symptoms of the trouble. At this time she had a sudden attack of pain and aching in the right leg and toes, but no discoloration. The pains would last for from a few minutes to a few hours and then disappear. Under date of March 25, 1895, he writes:

"Six weeks ago the middle finger of the right hand became very dark over the terminal phalanx, just as in the old attacks, but there were no cerebral symptoms. The discoloration has been disappearing, and is now almost gone. The nail is slightly raised, but I do not think it will come off. She consulted me lately for a return of the intermittent pains in the right leg. (These are probably pressure-pains from the myomata.) The general appearance is healthy, the pupils are normal, and the speech is natural. She took at this time nitroglycerin in very full doses without any benefit."

On April 8, 1895, Dr. Boutelle writes:

"Just now Mrs. —'s case is presenting some very peculiar features. On April 4th, about 9 P.M., she had an attack of faintness and giddiness, with pain in the index, ring, and little fingers of the right hand. I saw her the next evening about six o'clock. She had had a severe headache, particularly in the right temple. She said that her left arm and leg felt weak and heavy, but she could move them very well. There was, however, marked clumsiness of movement in the left hand. The fingers were semiflexed, and she had difficulty in straightening them. There was no discoloration in the left hand. The terminal phalanges of the index, ring, and little fingers of the right hand were discolored and tender to the touch. On the palmar aspect of the middle phalanx of the index finger and on the palmar aspect of the metacarpo-phalangeal joints of all the fingers of the right hand there were spots of discoloration, slightly tender. The following day the discoloration of the right hand was less marked. The speech and intelligence were normal. The slight paralysis of the left hand continues. She moves it with difficulty. To-day, the 8th, the discoloration is more marked in the fingers, which are very tender."

This patient's son, a young medical man, has kindly sent me the following note of an attack which occurred on July 19, 1895 :

While dressing the patient had an attack of partial unconsciousness. For ten minutes the right side was helpless and the speech impossible ; she was dull and very lethargic. The arm recovered motion first, and then the leg. Sensation was restored later than motion. She complained of a dull, aching feeling in the arm during the day. The hand was stiff and the middle finger blue. On the 20th there was still aching in the right arm, with now and then an exacerbation, until luncheon, at noon, at which time all the fingers and the hand became of a dead-white color. In a short time the tips of the fingers became dark blue, and spots of the same color appeared on the hand, particularly in the palm. The pain was very intense, and she suffered terribly, requiring several hypodermatic injections of morphine in rapid succession.

On July 21st the hand was dead white, cool ; the terminal phalanges blue, with a few scattered blue-spots on the hand. The tip of the nose was also slightly blue, the only occasion on which she had any symptoms referable to the face. There was a spot of ecchymosis an inch by half an inch from the styloid process of the right radius.

On the 22d she was very much better, and was able to get up. The hand was still cold, but the blue color of the fingers was fading.

On the 23d and 24th she improved rapidly. At this time an oculist examined her eyes, and said she had choroiditis, with beginning optic atrophy. In this attack the urine was negative.

On April 3, 1896, Dr. Boutelle writes :

" Mrs. — died January 29, 1896. She did very well for a time after my last report. Last summer she had a rather prolonged attack, not so severe though as the former ones, and without any paralysis or brain-symptoms, but with much pain in the fingers, which turned livid, but did not ulcerate. Early in January, after feeling pretty well, she one day took a drive and ate rather heartily at supper. During the night she had an attack of giddiness and vomiting, followed by intense pain in the right hand. Morphine had to be given freely to relieve the pain, which she could not locate exactly, referring it to the elbow or upper arm. All of the fingers turned blue, and there was no sensation in the hand. She was a little bewildered and confused mentally, but there was no loss of power of speech. Any movement of the hand or arm gave the most intense pain. Gradually the coldness and lividity increased, until the hand and arm were dark purple as far as the elbow. She sank into a coma, and died in a couple of days."

Her son writes about the final attack :

" On his return home at his mother's final illness he found the right hand and fingers completely gangrenous. The arm was mottled nearly to the shoulder, and as far as the elbow it looked as if it must also become gangrenous."

Severe and persistent headache, alternating with or even taking the place of a well-marked attack, has been referred to by H. C. Wood in the discussion of a case reported by Cleemann,[1] in which angina pectoris complicated the disease. The patient described the pain as of a character very similar to that which occurred in the fingers.

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[1] Transactions of the College of Physicians, Philadelphia, 1892.

I am indebted to Dr. H. V. Ogden, of Milwaukee, for the report of the following case, possibly of the nature of Raynaud's disease:

CASE III. *Painful swelling of the legs between the knees and ankles, recurring for two and a half years; falling attacks of doubtful nature, possibly hysterical.*—K. T., aged thirteen and a half years, German, of a neurotic family. She is a large, healthy-looking girl. Her illness began with what appears to have been an attack of chorea of considerable severity when she was ten years old. This was followed immediately by three groups of symptoms, viz., painful swelling of the legs, painful swelling behind the left ear, and falling attacks, all of which have continued until now.

1. About a year after the onset the condition of the legs is described by a physician who saw her, as follows: The child was kept to bed; the pain came on about 8 P.M., and lasted more or less through the night; the legs from ankle to knee were puffy, swollen, and red, extremely painful, and very markedly hyperæsthetic. She lost much sleep and ran down rapidly. This state had developed rapidly after the chorea.

When I first saw her in July, 1885, the painful attack came on in the middle of the morning, and lasted a couple of hours, and during this time the condition was much the same as described above, though much less severe. In the interval the skin had a reddish, mottled, œdematous look. Some constant pain and excessive hyperæsthesia. As well as could be made out the sense of temperature was blunted, if not lost. Knee-jerk present, though slight. The affected area extended from the insertion of the patellar ligament to ankle, and was sharply defined at each limit, and extended completely around the legs.

*December*, 1885. On the whole better. The affected area has become limited, by the approach of the upper and lower boundaries some two or three inches nearer each other. Has better and worse days, but for last year or more has been active in playing about, except during attacks of pain, and lately these have not been severe or distinct enough to make her lay up, but all day the condition is as described in July, 1885, the subjective sense of pain going off when she goes to bed, but coming on in the morning, sometimes before, sometimes after getting up.

2. Ever since the beginning has had a deep-seated earache, more or less constant. This is accompanied by redness and swelling over the mastoid process, which comes and goes, but never suppurates. The intensity of the pain and swelling coincides.

3. Falling attacks. At first, and for a year, she would fall forward, two or three times a day, on her hands and head, and unless caught would roll over on the floor. There was no aura, no convulsion, and probably no loss of consciousness, but of this she is not sure. Recovery was quick. For the last two years has always had time to get to a chair or lounge, never loses consciousness, and it never lasts more than five minutes, and often only a few seconds. I saw one which consisted merely in putting her head on her mother's shoulder, who was sitting near her, and almost immediately picking it up again. It had the appearance of being done for my benefit. During these attacks she feels faint and powerless. Heart-sounds normal.

# EARLY RUPTURE IN EXTRA-UTERINE PREGNANCY AND ITS TREATMENT.

By Fernand Henrotin, M.D.,
of Chicago.

Gynecological surgery has almost reached a point where it can be said that, barring malignant diseases of an advanced character and other forms of trouble in which the condition of the patient is such that the fear of impending dissolution holds the surgeon's hand, there is a prescribed operation for almost any possible condition; and to some men it might seem as if the work was complete and hereafter the field was open, each individual being capable of filling a place in accordance with his technical skill and practical knowledge. A little reflection, however, cannot fail to convince that beyond this there is needed that which even men of the most brilliant ability sometimes do not possess, namely, well-balanced judgment in the application of methods. This attribute is not given to all in equal proportion, but that which is congenital can be cultivated to a high degree by systematic training in the analysis of obscure conditions, and particularly by a comparative study of the conclusions reached by fellow-workers.

The analysis of any given case demands careful scrutiny of each individual fact in its history, and the determination of the method to be followed must be based upon a logical correlation of the factors involved. Probably no disease in which surgical interference is called for demands a greater exercise of broad sense than extra-uterine pregnancy, with its varied symptoms and its startling and tragic developments.

An extra-uterine ovum may be located in almost any part of the pelvis, either intra- or extra-peritoneal, and by reason of its location may give rise to the most complex symptoms. If in process of growth, its capability for injury is increased in proportion to the resistance of the tissues and the general condition of the patient.

The object of this paper is simply to call attention to some of the peculiarities of early ruptures, and from these to draw some deductions regarding their management. I shall limit my remarks to those cases in which rupture takes place prior to about the second month.

Clinical experience has led me to make a further arbitrary division of early ruptures into two classes, each of which possesses sufficiently distinctive characteristics to warrant the formulation of a definite plan of treatment.

The first class of cases may be termed complete rupture with free primary abdominal hemorrhage; the second class, incomplete ruptures, which include rupture into the broad ligament and dissecting interstitial hemorrhages which may eventuate in free secondary hemorrhage.

Experience demonstrates that complete primary ruptures generally occur prior to the seventh week, and so frequently in the fifth or sixth week after the last menstruation that pregnancy is not suspected. As women with pre-existing pelvic diseases are especially prone to extra-uterine pregnancy, menstrual irregularities easily escape attention.

It is not contended that these very early ruptures are invariably complete, for there is reason to believe that many of the small, early extra-uterine pregnancies rupture into the folds of the broad ligament, give rise to only slight symptoms, are absorbed, and disappear.

The diagnosis of primary complete rupture prior to the seventh week is the diagnosis of intra-abdominal hemorrhage.

The absence of marked disturbance of menstruation does not preclude the existence of early rupture.

The failure to observe the discharge of decidual membrane is not significant, for this may occur simultaneously with the rupture or may closely follow it.

The physical signs are identical with those of intra-abdominal hemorrhage. The failure to recognize a tumor near the uterus is not very important. Thorough examination is difficult on account of the condition of the patient. The ovum may be so small as to produce no appreciable enlargement, or it may have been expelled into the general peritoneal cavity.

Differential diagnosis, on account of its important bearing on treatment, will be considered under that head.

The following case furnishes an excellent illustration of the symptomatology and treatment of complete primary rupture :

Case.—On September 15, 1894, Mrs. J. P. C., a resident of Chicago, was suddenly seized with a severe pain in the abdomen, which she described as feeling " like something breaking in her abdomen." Simultaneously there was a gush of bright, pinkish, watery fluid from the vagina, which flooded her thighs and saturated her clothing. She was seen by a physician at 1.30 p.m., and by another an hour later, and at 5.30 I reached her bedside. At this time she was almost *in articulo mortis*, absolutely pulseless, and perfectly cold. The patient was thirty-three years of age, had been married twelve years, and had three children, aged, respectively, ten, five, and three years. She had never had a miscarriage, and, so far as she knew, had never had uterine disease of any kind. She was a woman of magnificent physical development, weighed 230 pounds, and was full of pluck and courage. She had always menstruated regularly, but for several years had flowed for six or seven days at each period. On August 12th, exactly five weeks before, she menstruated regularly, and the flow continued for six days. On August 29th, without warning, she suddenly had a severe pain, resembling a labor-pain, which continued for ten minutes and was accompanied by nausea and vomiting. On August 31st, while travelling on a car, this pain recurred and lasted half an hour. While away from home she had two or three short, severe pains and a slight diarrhœa.

On September 9th, after her return home, she began to menstruate exactly on time; but the flow was checked by a sudden fright, her son being seized with convulsions in her presence. The same evening she had another short, acute attack of abdominal colic. The menstrual flow returned the next day, but ceased after a few hours. It again returned, but ceased two days before the final attack.

When I first saw the patient it was evident from the profound collapse, indicated by the total absence of radial pulse, the excessive pallor and death-like coldness of the body, that she was suffering from internal hemorrhage; while the dyspnœa made it plain that the time for action was short, and that if something was not immediately done, it would be too late. Further physical examination revealed nothing more than local tenderness over the whole abdomen. Sudden pressure would elicit repeated expressions of pain.

I made a careful and thorough vaginal examination, which was entirely negative. The fact that she was flowing at the time of my arrival of course directed my attention to the pelvic organs as the probable source of hemorrhage, and the information obtained from the patient's friends and from herself regarding the previous attacks of pelvic pain made more than probable the diagnosis of ruptured tubal pregnancy. I made the examination, therefore, with two ideas most prominently before me: First, the determination of the presence of free blood in the abdominal cavity; and, second, the discovery of a mass on one or the other side of the uterus. I failed, however, in both respects; repeated percussion over the abdomen absolutely failed to give any impulse or sense of fluctuation, either upon deep digital pressure into Douglas's pouch or at either side of the uterus, and no enlargement of the Fallopian tubes could be detected. The thickness of the abdominal walls in this patient greatly increased the difficulty of and embarrassed the examination; notwithstanding all this, I never for a moment doubted the correctness of my diagnosis.

The foot of the bed was elevated, the pillows removed, strychnine and nitroglycerin administered hypodermatically, and a quart of normal salt-solution thrown into the rectum. At a little after seven o'clock, an hour and a half after my arrival, the preparations for the operation were complete. At this time she had been without pulse at either wrist for between three and four hours.

The foot of the bed was now elevated so as to obtain the highest possible Trendelenburg position, another saline injection was thrown into the rectum, and the incision made. The correctness of the diagnosis of intra-abdominal hemorrhage was evident even before the peritoneum was incised, and after the incision was made and the intestines pushed back the blood surged out over the surroundings.

The right Fallopian tube was caught with a large clamp-forceps parallel to the uterus. The ligatures were placed and the removal of the tube effected rather by touch than by sight, the latter being rendered almost impossible by the enormous amount of blood which obscured the field. A careful estimate of the amount of blood in the abdomen would place it at at least eighty ounces. This estimate was concurred in by the gentlemen present, and is given without the least desire to exaggerate. Thirty to forty ounces of blood were lost by sponging, by the manipulations and movements of the patient, and by the removal of clots. Forty to fifty ounces of fluid blood were left in the abdomen.

Ether was the anæsthetic used; its administration was suspended while the abdomen was being closed. The closure of the parietal wound was effected by a running catgut suture for the peritoneum, four or five buried iron-dyed silk sutures to unite the sheath of the rectus, and external sutures of the same silk, not penetrating the abdominal cavity.

Immediately after the operation a small, almost imperceptible, very rapid pulse returned. Three pints of normal salt-solution were carefully injected into the cellular tissue beneath the breasts and in the axillary spaces, and three pints of strong, black coffee with salt added were injected into the rectum.

When I left the patient at 3 A.M. she was still cold, but had a reasonably good pulse of 150.

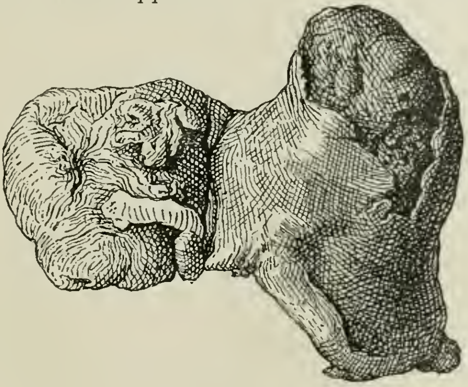
*September 17th.* Pulse 140, and the patient was quite warm.

*18th.* Pulse 132.

*19th.* Pulse 120.

*20th.* Pulse 100.

*21st.* Though the patient is still in bed, she is a well woman, has no pain, is in perfect spirits, and is joking about her late illness. The two lower superficial stitches suppurated.



The specimen which I here present is apparently a beautiful example of the apoplectic ovum or tubal mole *in situ*. It is no longer a complete ovum, for it lacks, to all appearance, a central cavity, the amnion, and the embryo. As I desire to speak particularly of the clinical features connected with very early ruptures, I have thought it best to present the specimen entire, without making or having made a more complete analysis of its component parts, which would necessitate its destruction in a gross anatomical sense and would fail to convey certain peculiarities to which I wish to call attention.

Bland Sutton says: "Frequently no trace of embryo is found. A fleshy mole [as this seems to be] is really an early ovum with its membranes, into which blood has been extravasated. The extent of the extravasation varies; occasionally the blood invades the amniotic cavity and overwhelms the embryo. Fleshy moles, similar to those arising in the uterus, occur in connection with tubal gestation, and they appear to be more common between the fourth and eighth week than at any other period. Their formation is, in most cases, attended with disastrous consequence to the individual unfortunate enough to become the victim of tubal pregnancy."

He also adds: "It is of some importance to be familiar with their chief features, because the existence of a fleshy mole is certain proof of pregnancy, and the formation of a mole in the tube is a frequent means of inducing tubal rupture."

The lumen of the tube is perfect from either end to the seat of the ovum or mole. It is also noteworthy that the fimbriæ are partially drawn into the abdominal ostium; both of these points are in accord with the opinion universally held that the abdominal ostium of the tube does not close until the eighth week of gestation. On this account and from the history of the case it is probable that impregnation occurred later than five weeks previous to the rupture. Another interesting point is the great attenuation of the tubal wall at the location of the tear. The tube evidently began to be thin and to spread out almost as early as the growth of the ovum commenced, which is contrary to the accepted theory in most cases. The rupture took place opposite the point of attachment, which is presumably the placental site, and this is directly contrary to the dictum of Doleris, that rupture always takes place at the placental site.

Numberless cases of tubal pregnancies from the seventh to the twelfth and fourteenth week, as well as later cases, are reported in the literature of the day. Ordinarily the lengthened history and the presence of a plainly perceptible extra-uterine abdominal mass make the diagnosis of the case plain and the indication for operative interference imperative, while the responsibility naturally decreases as the diagnosis is made more certain.

In the presence of serious intra-abdominal hemorrhage it is almost criminal to fail to cut down on a plainly perceptible mass closely connected with the uterus. To open the abdomen of a patient *in extremis* when no enlargement can be felt, when there has been no special disturbance of menstruation, and when the patient gives almost no history of preceding illness, may be just as imperatively indicated, but it carries with it much greater responsibility and much more uncertainty.

Baldy, of Philadelphia, in an article read before the American Gynecological Society in 1890, the statistics in which were based particularly upon the reports of Dr. H. F. Formad, the coroner's physician of Philadelphia, estimated that 1500 women had lost their lives in the United

States during the few preceding years on account of undiagnosticated extra-uterine pregnancy. Surgeons and gynecologists have done much to reduce these figures during the last five years, but all must allow that deaths from this cause still occur very frequently, and all will concur with me in the assertion that where intra-abdominal hemorrhage of sufficient quantity to cause death results from ruptured tubal pregnancy prior to the seventh week of gestation the mortality must necessarily still be very great. The frightful rapidity of the death of the patient after rupture has led many authors to draw attention to the fact that in these cases judicial investigation has repeatedly been made on account of the suspicion of foul play.

The literature of extra-uterine pregnancy is so extensive that it would be a gigantic task to go over it in detail, and, besides, there is so great similarity in the reports from various quarters that the different series hardly differ. Schauta, A. Martin, Schrenk, Parry, Orthmann, and many others have collated large series of cases, and I may say that since the impetus given by Lawson Tait to the proper treatment by laparotomy of all cases of intra-abdominal rupture of extra-uterine pregnancy there are very few men with even a leaning for gynecology who have not reported one or more cases of this kind, while the prominent men have had larger series. The proportion of cases, however, in which intra-abdominal tubal ruptures prior to the seventh week have been diagnosticated and operated upon is comparatively small as regards the whole number of cases. It must, of course, be admitted that such early ruptures are relatively rare, and that most tubes resist beyond that time, and that the usual time for rupture is between the seventh and twelfth week. There is no reason to believe, however, that a comparatively large proportion of the ruptures that occur prior to the seventh week prove fatal because of the lack of proper diagnosis. The cause of this is evident. The patient has had less time to complain and to develop symptoms, and consequently to think of seeking medical aid. As the menstruation has only recently, or has not at all deviated from the normal, the cause may remain unsuspected; and, lastly, the smaller the swelling the less perceptible it is upon examination, and therefore the more doubtful and difficult is the diagnosis. When a patient has had symptoms for several weeks she may have had time to consult an expert through her family physician, and the character of the case may be suspected before the secondary rupture; but these early cases often remain in the hands of the general practitioner, who only suspects the cause of death after the death of the patient.

There seems to be something peculiar, however, in these early ruptures. So far as I can judge from the literature, in the majority of the patients operated upon, in which a small tubal gestation of five or six weeks was found to have caused intra-abdominal hemorrhage, the symptoms were usually described as very acute and the hemorrhage as most abundant. Lawson Tait mentions, for example, a woman who was seized with pain at 1.30 P.M. and died at 9 P.M. from intraperitoneal hemorrhage caused by rupture of a five weeks' ovum, the rupture being not larger than a pea. Several of these cases have been reported during the last two or three years. According to Hermann and Bland Sutton, most tubes hypertrophy following tubal pregnancy; but they say that this is not always the case, and that the walls of the tubes in contact with the ovum sometimes seem to stretch and become attenuated from the beginning of gestation. It may be that these are the cases most liable to early rupture. Where the tubes are thicker they may possibly not bleed so easily when torn and may not tear entirely through so quickly. For the elucidation of these points more numerous and more thorough reports of cases of this variety are necessary, for it has not yet been proved that the tubes which rupture early are diseased at all, or are more diseased than those that resist until a later date.

Some authors have described an interstitial tubal pregnancy and have claimed that there is no mucous membrane in contact with any part of the ovum previously to rupture. Their explanation is in accord with Tait's views, namely, that the ovule becomes arrested at some point in the tube where not only the ciliated epithelium is destroyed, but where the mucous membrane is also deficient to a greater or less extent, and that the ovum then develops and spreads out in the walls of the tube. This explanation is unsatisfactory because the deeper layers do not produce the tissues wherein an ovum could be expected to develop.

Upon looking over the reports of operations for this condition during the past three or four years, we find a gratifying uniformity of success in the results obtained.

Many authors report successful cases, while a considerable number of the deaths were of patients who, at the time of operation, were found to have complications, usually diseases of the other tube or ovary. As the operator in these cases was not willing to let the opportunity pass by, he operated for the complicating difficulty. The danger in these cases lies in the presence of blood in the abdomen and the ease of development and rapid spread of sepsis. A clean peritoneal cavity will dispose of a considerable amount of septic material, provided it is not too virulent; a peritoneal cavity half full of blood will have difficulty in disposing of the blood itself, and the complication of the removal of a pyosalpinx on the other side entails much additional danger to the patient.

The question of leaving a considerable amount of blood in the peritoneal cavity after an operation of this kind is one that requires careful consideration. In operation involving or dealing with septic material it is considered, and I believe properly, most advisable to leave the cavity as free from blood as possible; but in such a case as I describe there is usually sepsis present, from the nature of the case. Any operator who has encountered the large recent abdominal accumulations of blood will readily acknowledge the impossibility of their entire removal. This difficulty is materially increased by the necessity of inverting the patient, thus allowing the blood to collect in the subdiaphragmatic region, but lessening syncope. This blood is of value to the human economy. Divers opinions are held as to the propriety of allowing large quantities of blood to remain in the abdominal cavity or of attempting to cleanse the cavity thoroughly before closing it. Both these measures seem to me to have their indications.

When examination fails to reveal the presence of complicating septic conditions which are prone to exist in the pelvis or around the appendix, it is better to close after removal of the large clots. The arguments in favor of this course are: the shorter the operation the better the prospects of recovery; the less the manipulation the less are the absorptive powers of the peritoneum impaired; the absorption into the circulation of the serum left in the cavity begins at once, and stimulates the patient pending the revival of vital forces.

When, however, symptoms of sepsis are present, or when during the operation septic conditions have been encountered, the cavity should be cleansed as thoroughly as possible consistent with the condition of the patient, because under these conditions the more blood the greater the sepsis.

Saving time may mean saving the patient, and in desperate cases a large gauze-drain may have to be employed instead of prolonged cleansing. It is in these extreme cases that saline infusion, transfusions, and injections are of such undoubted value.

Dührssen, cited by Fenger, calls attention to the danger of narcosis in an exsanguinated patient, and the further danger of operation in the abdomen under such circumstances where the congestion of the abdominal organs which naturally follows any laparotomy is likely to cause fatal cerebral anæmia and death on the table. He, therefore, advocates infusion of saline solution preparatory to operation. This was first proposed by Wider after Dührssen had lost one patient operated on during shock. He made in his succeeding cases infusion of one or two litres of saline solution prior to operation, with satisfactory results, a stronger pulse lasting during the operation and the patient recovering.

The value of the Trendelenburg position as an adjunct to the above measures is self-evident.

Another question of vital importance is that of operating during profound shock. Great variations of opinion exist in regard to this question, and further reports of cases must be made by reliable observers before this controversy can be settled; but even in these cases important indications can frequently be outlined which will prove a valuable guide to the intelligent operator.

Chief among these is the differentiation between temporary fainting from moderate loss of blood and profound shock from excessive hemorrhage. The fainting woman is unconscious during swoons, but rallies from time to time, this being indicated by the variable pulse, slight flushes passing over her face, which shows little anxiety, her body-heat being variable, and the lowering of the head being quickly followed by amelioration. The woman suffering from rapidly progressing, uninterrupted hemorrhage to the point of exsanguination, after the first swoon remains conscious; her pulse steadily becomes weaker until it can no longer be appreciated; her face, which betrays extreme anxiety, is permanently blanched; her body remains constantly cold, and lowering of the head produces but little change; she cannot speak above a whisper, and is very still unless she has reached the stage of delirium which immediately precedes death. This differentiation cannot always be absolutely made, as the fainting woman may pass into profound shock from repeated hemorrhages; but it is important that a decision be made on this point.

The differentiation between tubal rupture and tubal abortion may have an important bearing on the course of treatment. Generally speaking, there is less danger in waiting for a rally after tubal abortion than after tubal rupture. The difficulty lies in the differentiation.

Some authors mention the character of the pain as being a means of distinguishing between rupture and abortion, and it is very possible that there may be something of value in this sign. The pains of rupture are more likely to be successive, distinct attacks of short duration; these may be hours or days apart, accompanied by slight faintness and more or less shock, each attack leaving the patient entirely and apparently well until the final catastrophe, when the breach in the peritoneum occurs and free hemorrhage takes place.

In tubal abortion, when once the ovum is reasonably detached, we should naturally expect the pains to recur at very short intervals and to continue, unless checked by morphine, until the ovum is expelled from the tube, about which time symptoms of hemorrhage appear.

Another sign described by authors is the location of the tumor. When the mass is felt toward the uterine end of the tube the case is supposedly one of rupture; while when it is situated toward the outer end of the tube abortion is more probable. This distinction, however, is of little value in the case of early rupture now under discussion, for, as I have mentioned before, the mass is frequently very small and difficult to outline, or there may be no enlargement perceptible because the ovum has been previously expelled into the general cavity.

Besides this, the tube with its enlarged portion frequently drops to the side of or behind or below the uterus, making it impossible to determine which part of the tube is affected. My reasons for laying so great stress upon the distinguishing signs between rupture and abortion are that equally alarming symptoms may accompany either, and that so many operators advise deferring the operation until the patient rallies. It is the delicate discrimination in the individual cases which enables us to determine what to do.

True surgery demands the ligation of every accessible bleeding vessel, hemorrhage from which may endanger life. If in a given case we have reason to believe that tubal abortion has occurred, we may be justified in waiting for a reasonable time for reaction to take place; but in cases of rupture our duty is plainly to obey the first law of surgery and ligate.

The rapidity of the march of symptoms from the first signs of rupture to the establishment of deep collapse is a most important indication, and may demand prompt action. If a woman with few premonitory signs becomes suddenly faint, develops symptoms of free abdominal hemorrhage, and without rallying, and, in spite of appropriate treatment, within one or two hours passes into profound collapse, the inference becomes almost a certainty that the case is one of early rupture of an ectopic pregnancy with free primary abdominal hemorrhage, and that death will probably ensue unless radical measures are taken to stop the flow of blood.

The more acute the symptoms the more imperative becomes the necessity for prompt interference—that is, ligation.

Dr. Maurice Richardson, of Boston, one of our ablest exponents of true surgery, in an exhaustive article on this subject,[1] clearly demonstrates facts regarding treatment so suggestive that I make the following quotation:

"Twice in my own experience an hour has been long enough to place the patient in a hopeless collapse. In one case which I saw for the first time at 1 o'clock, a woman in whom there was no suspicion of hemorrhage or any other acute condition, at 2 o'clock was pulseless. She lived during the afternoon and night, but at no time was her condition good enough to justify interference."

He says again: "For some reason the extravasations from a ruptured fœtal sac are attended by shock which is out of all proportion to the amount of blood lost. In such instances the patient suffers not only from loss of blood, but also from the extensive woundings of the peritoneum, the so-called peritoneal shock. In these cases there are not only the signs of hemorrhage, but also those of great systemic depression. In fatal cases of this kind death takes place in a few hours.

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[1] Richardson, M. H.: Extra-uterine Pregnancy and Pelvic Hemorrhage; Cases and Remarks. Annals of Surgery, December, 1894, p. 705.

In two that I have seen the patients were so nearly dead that I thought the only chance of their recovery lay in the administration of stimulants and intravenous injections until they could endure the brief manipulation for controlling further extravasation. Death followed in both cases. In a third, which was also fatal, I determined to operate even in face of impending death. In this case the same fatal determination occurred, though not until reaction and general peritonitis had had time to develop. In the first case there were extreme pallor, *restlessness* [italics mine], and dyspnœa, with rapid and almost imperceptible pulse. Death took place while we were preparing to infuse salt-solution. In the second case the patient became collapsed in a few minutes after the rupture of the sac. The pulse was so rapid and so faint that no operation was seriously considered.[1] In the third case the patient's condition was not quite so plainly hopeless. By an operation not occupying more than fifteen minutes the fœtal sac was removed and the abdomen cleared of blood. The patient did not die of shock, but lived long enough to develop a fatal peritonitis."

The author is undoubtedly the best judge of the course of treatment to be pursued in the cases he describes, but the following comments seem to me pertinent:

In the first case mentioned a woman with no suspicion of hemorrhage was pulseless an hour later, and at no time was her condition good enough to justify interference; but yet she lived during the afternoon and night. It is probable that prompt ligation in this case would have given the patient a chance for her life.

The author speaks of "peritoneal shock" out of all proportion to the amount of blood lost. When cases of this kind are encountered it is my opinion that the profoundness of the shock is dependent upon complicating conditions, such as sepsis or very small hemorrhages frequently repeated. The peritoneum is so tolerant of extensive injuries that acute, persistent, profound shock must, in the absence of appreciable complications, be considered as due to extensive loss of blood.

In the absence of the signs which immediately precede death and really belong to the death-agony, it is practically impossible to determine the resistant power of the patient and how long she will live.

In another of the author's fatal cases the patient was pulseless, the respirations were shallow and rapid, and there were extreme pallor and great restlessness. This bears out my statement that pallor, dyspnœa, and imperceptible pulse do not always forbid operation, but that restlessness is frequently the sign of impending death.

Again, in the third fatal case, he says: "I determined to operate in face of impending death." It is a significant fact that this patient rallied from the operation, but died five days later from well-developed general peritonitis, "due to an error in technique, namely, the rapid and necessarily imperfect preparation of the skin."

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[1] Here the author evidently refers to the second case which he mentions in the first part of his article, for he there states that this woman lived during the afternoon and night.

From personal experience and a study of the cases reported by other observers concerning complete rupture with free primary abdominal hemorrhage due to ectopic gestation, I venture the following deductions regarding treatment as applied to the different varieties:

A woman suddenly faints, and immediately receives efficient medical aid, but, notwithstanding all treatment, in an hour is in profound collapse with the clinical signs of early rupture of extra-uterine pregnancy. What should be done? She is bleeding to death from a large rupture or a small rupture through the vessels, or both, and abdominal section should forthwith be made and direct ligation applied. Fill a bowl with normal saline solution, place the patient in the Trendelenburg position, on the bed, if need be; thoroughly cleanse the field of operation; open quickly; pass the hand at once through the blood to the point of rupture; place a light clamp on each side of the rent; wipe away sufficient blood to enable the ligatures to be passed; sweep the open hand a few times around the abdomen to remove the large clots and possibly the product of conception; exsect the tube; make sure the hæmostasis and immediately close. Hemorrhage from the bleeding points can often be controlled in four or five minutes, and the whole operation completed in fifteen. During all this time, if necessary, continuous injection of normal saline solution into the cellular tissue may be made by an assistant. I believe that the time unnecessarily spent in cleaning the abdominal cavity has caused the death of more than one woman, as the liquid portion of the blood acts as an intraperitoneal transfusion. This is the treatment for what Richardson terms the fulminating variety.

If, during the operation, septic material is encountered in the abdominal cavity, be it exudate around the affected tube or disease of the other tube, or doubtful conditions in the appendicular region, or if the operator is not reasonably certain of the aseptic character of his manipulations, then, if the patient's condition permits, the abdominal cavity should be thoroughly cleansed, after which drainage had better be employed through the lower angle of the wound or the vagina. If, however, the patient's strength will not allow such prolongation of the operation, the cleaning of the abdominal cavity may be shortened or even omitted, and a large Mikulicz drain may be introduced.

In arriving at a proper conclusion whether or not a case of this variety will still be able to stand operation, the presence of great restlessness is a symptom of very considerable importance, as it frequently means impending death, and, therefore, might directly contradict interference. Discrimination should also be used in differentiating, if possible, between recurrent temporary swoonings and profound progressive collapse, while it is to be remembered that the shorter the time between the beginning of the attacks and profound collapse the more urgent the necessity for immediate action.

In the class of less acute cases, in which the collapse is not so extreme and the patient begins to respond to stimulation, it becomes of the greatest importance, by inquiring into the history, to endeavor to differentiate between tubal rupture and tubal abortion, and under these circumstances it may be proper to defer operation for a few hours or even for a longer time.

Further careful observation will probably shed more light on the diagnosis between the two above-mentioned conditions. It should be borne in mind that repeated attacks usually mean rupture.

When the time of hemorrhage in the free cavity is more remote and the patient has rallied from the initial shock with a so-called abdominal hæmatocele, operation is unnecessary unless the disease is not removed by nature. In these cases, at the first sign of sepsis, operation is demanded; and, barring contraindications, vaginal section is the operation of election.

Acute early ruptures with free primary abdominal hemorrhage should always be operated upon by the abdominal route.

353 LASALLE AVENUE.

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# THE THERAPEUTIC VALUE OF HYDROBROMATE OF SCOPOLAMINE IN PLASTIC IRITIS.

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THE findings in this brief paper, which are but a few of a series of results that represent nearly two and one-half years' careful clinical research with this drug, are limited to a study of its therapeutic action upon this form of special ocular disease. These have been published separately because it has been found that in this class of cases the drug proved itself as one of the most efficacious and one of the most valuable agents that has been employed for quick mydriatic purposes and prompt reparative action. Both the private and public practices of the writer have been freely drawn upon to study the different effects of the drug, and quite a number of cases, especially the private ones, which, without exception, have been personally studied in every detail, have been submitted to varying modes of administration, until now, after a most extended experience, the results as given below are unhesitatingly offered.

Not endeavoring in this communication to solve the problem as to the absolute identity of the drug, either in its isomeric relations, as has been attempted by some, or to the question of its being but an admixture of the two bases hyoscine and atropine, as has been done by Lewin,[1] or even as yet to compare its physiological workings,[2] which are said by others to be identical[3] with other alkaloid products in the tropine series, the writer has here sought only to determine its relative workings upon inflamed iris-tissues, especially in the incipiency of the disturbance and when the inflammatory reaction has been thoroughly established.

The writer prefers the hydrobromate salt to the hydrochlorate, as he has found the former to be less irritating, and the solution, especially if prepared with a small quantity of boric acid, as Murrell[4] has suggested, to remain most certainly free from any fungoid degeneration for greater periods of time, even for several weeks.[5]

Whilst personally employing the drug the writer has never seen any serious general intoxicant effects[6] even where he has found it necessary, on account of slow and difficult endosmosis through the infiltrated tissues of the cornea and incomplete action upon the rigid and tense structures of the iris, to repeat the instillation several times during the course of an hour. He attributes this in a measure not only to the lessened absorption of the drug, but to the care that he takes to have the lower lid everted and the lower canaliculus pressed upon while the fluid is slowly dropped upon the superior limbus of the cornea. His own experience is that it acts much more quickly upon inflamed tissues than stronger solutions of atropine, and that in accordance with the experience of Raehlmann,[7] Bellarminow,[8] and Grossman,[9] cocaine primarily employed (or, as he has tried in some instances, conjointly) markedly increases the promptness of one of the most important desired-for results, the breakage of freshly formed synechia.

In the great majority of cases the best and most decided results were obtained by a double instillation of a one-tenth of a 1 per cent. solution at a minute or two interval, rather than by a single instillation of one drop of a one-to-five hundred solution (*i. e.*, one-fifth of a 1 per cent. strength). In each instance the dose employed was the same; but in the former plan, where it was divided into two administrations, the amount received by the organ was most certainly greater, as was proved by the result.

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[1] Deutsche medicinische Wochenschrift, 25 April, 1895, S. 269.

[2] The writer expects to engage himself in a series of experimental studies that are intended to place the drugs duboisine and hyoscine in the same relation with atropine as these experiments with scopolamine. He also intends to make investigations as to the actions of definitely graded mixtures of the drugs with atropine.

[3] Peters: Centralblatt für praktische Augenheilkunde, 1893, S. 500.

[4] Annals of Ophthalmology and Otology, October, 1895.

[5] In private work, where everything is under personal supervision, the writer has preferred to make repeatedly fresh solutions of all such drugs.

[6] In many neurasthenic subjects, especially women, the drug used in the amounts here given for refractive purposes produces a giddiness of a few minutes' duration. The most refreshing somnolence is frequently obtained whilst the patients are waiting for the drug to obtain its maximum effect upon the ciliary muscle.

[7] Klinische Monatsblätter für Augenheilkunde, February, 1893.

[8] Vrach, 17, 1893.

[9] Gazette médicale Sciences de Bordeaux, 17 Mars, 1895.

In regard to its slight anæsthetic qualities upon the cornea, referred to by Gutmann,[1] the writer cannot give answer affirmatively or negatively, as his cases presented so many types of irritation and inflammation that no dependence could be paid to this one of the most uncertain subjective findings; to him the subject still remains *subjudice*.

As to the certainty of its effect upon intraocular tension as clinically studied by Grossman,[2] Hobbs,[3] Ritchie,[4] and others,[5] the writer, as previously hinted, is engaged in determining this question in another and more scientific way. He can, however here assert that he has never had any untoward symptoms or seen any bad results from such a cause in all of the cases in which he has employed the drug.

Its great cost,[6] unfortunately, has prevented its more frequent use in the writer's public practice,[7] and thus debarred him from prescribing it as a house-remedy in such cases; but this factor will be necessarily excluded if there should be an increased demand for the drug.

In regard to the permanency of its effects, repeated examination has, in the writer's experience, verified the opinion that although it accomplishes primarily more than is done by four to five times[8] the strength of sulphate of atropine in cases that are seen early and during the incipiency of the attack, yet the atropine seems to hold on to its effects for much longer periods of time, thus necessitating the alternate use of the two drugs in gradually lessening amounts and greater intervals after the scopolamine has attained its utmost primary action.

CONCLUSIONS. 1. Hydrobromate of scopolamine is of the greatest value in the local treatment of the various forms of plastic iritis.

2. The primary reparative action and quieting power of hydrobromate of scopalamine as compared with those of similar doses of sulphate of atropine in the treatment of plastic iritis are much more promptly obtained with the former than with the latter drug, this being true in the majority of cases even when the latter drug is used in dosages that

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[1] Therapeutische Monatshefte, März, 1894, S. 126.

[2] Loco citato.

[3] The Atlanta Medical and Surgical Journal, September, 1894.

[4] The Journal of Ophthalmology, Otology, and Laryngology, January, 1895.

[5] Vide Raehlmann, Illig, Lobassow: Revue générale d'Ophthalmologie, Mars, 1894.

[6] Vide Schürmayer: Medicinische Neuigkeiten für praktische Aerzte, 14 July, 1894.

[7] Seventy-five cents per grain at present writing.

[8] Vide Raehlmann (loco citato), and comments by Illig in the Müñchener medicinische Wochenschrift, 15 August, 1893, xxxiii.

are equal to quadruple or quintuple the strengths that are employed of the former drug.

3. The duration of the healing and soothing powers of hydrobromate of scopolamine as compared with those of equal doses of sulphate of atropine in cases of plastic iritis does not seem to be so lasting with the former as with the latter drug, this being true in the majority of cases even when the latter drug is used in four or five times the strength-doses as the former.

4. For quick and active measures, which are so eminently necessary in incipient cases of plastic iritis, and during the early stages of inflammatory reaction, hydrobromate of scopolamine is to be preferred to sulphate of atropine.

5. Where prolonged use of such drugs is necessary, as in many cases of the chronic form of the disease with subacute exacerbations, the alternate employment of hydrobromate of scopolamine and sulphate of atropine seems empirically to be the best method of local administration that has been devised.

6. As clinically employed, the best salt of the alkaloid seems to be the hydrobromate; the best method of instillation appears to be that which is accomplished by dropping the solution upon the upper corneal limbus whilst the lower punctum is everted and the corresponding canaliculus is pressed upon; and the most efficient amount to be used at one sitting is two drops of a one-tenth of 1 per cent. strength (1 to 500), repeated, if necessary, as often as three times during the course of an hour, and preceded, when desired, as in some instances where there are much irritation and pain, by two drops of a 2 per cent. solution of hydrobromate of cocaine a few minutes before each instillation of the scopolamine.

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# ON THE IDENTITY OF THE CONDITIONS COMMONLY KNOWN AS WANDERING RASH OF THE TONGUE AND MOELLER'S SUPERFICIAL GLOSSITIS.

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Synonyms. *Pityriasis linguæ* (Rayer, Vogel, Betz). *Lichenoïde lingual* (Vanlair). *Intertrigo linguæ* (Santlus). *État tigré de la langue* (Bridou). *État lichenöide de la langue* (Gubler). *Langue géographique* (Bergeron). Wandering rash (Barker, Butlin). *Syphilis desquamative de la langue* (Parrot). *Flüchtige gutartige Plaques der Zungenschleimhaut* (Caspary). *Desquamation épithéliale de la langue* (Gautier). *Glossite exfoliatrice marginée* (Fournier, Lemonnier). *Kreisfleckige Exfoliation der Zunge* (Unna). *Eczema en aires ou marginée* *desquamatif* (Besnier). *Oberflächliche Exkoriationen an der Zunge* (Hack). *Circinate Eruption of the Tongue* (Colcott-Fox) *Eczema de la langue* (de Molènes). *Chronische Exkoriationen an der Zunge* (Moeller). *Moellersche Glossitis Superficialis* (Michelson).

The affection known to English medical writers under the terms wandering rash of the tongue or geographical tongue is sufficiently common to be familiar to most physicians in charge of large outpatient clinics where the examination of the tongue is a matter of routine. Although, as indicated by its synonyms, it has been frequently described, yet its etiology remains conjectural and its relation to various morbid conditions uncertain, while information regarding its pathological anatomy is meagre and incomplete.

Another lingual condition known hitherto apparently only to German observers under the name of Moeller's superficial glossitis, and generally considered by them distinct from the preceding, is even more imperfectly understood.

Outside of the country where it was first described it seems to have attracted no notice from clinicians.

The object of the following paper is to present the clinical and pathological features of several cases illustrating these conditions in connection with a review of their literature. The patients came under my observation in the Clinic for Diseases of the Throat at the Massachusetts General Hospital. From five of them small portions of the morbid areas were painlessly removed under cocaine, an operation to which the patients submitted willingly and with interest. The histological work was done in the pathological laboratory of the Harvard Medical School under the supervision of Dr. Councilman, to whom and to Dr. Mallory I desire to express my thanks for much kindly interest and advice.

Case I.—L. G., female, single, aged twenty-one years, American, came, April 25, 1895, to the clinic for an atrophic rhinitis, exhibiting also moderate anæmia and poor nutrition, but otherwise no discoverable abnormality. On May 24th the patient returned and presented a striking alteration of the tongue, which she had noticed for the first time a few days previously. A short distance anterior to the circumvallate papillæ were two red, more or less oval areas, one on each side of the middle line of the dorsum, measuring, respectively, 1.5 by 2 cm. and 2 by 4 cm.; the surface of each being smooth, clean, and devoid of any trace of filiform papillæ, though the fungiform remained; each area was for half its circumference abruptly bordered by a slightly but sharply elevated whitish wall about 2 mm. in diameter, easily removable by scraping, by which there was disclosed underlying it and corresponding to it a smooth, vivid red, but not bleeding surface. For the remainder of its circumference each of the red areas was indistinctly limited, becoming gradually merged into normal tissue by a reappearance and progressive increase in size of the filiform papillæ.

Anteriorly on the dorsum were two smaller areas similar to the preceding, except for a greater predominance of the fungiform papillæ, a condition naturally to be expected from the anatomical structure of the part. On May 28th the two anterior areas had disappeared and the two posterior ones were rapidly returning to a normal appearance, the whitish border being no longer visible, and the desquamated regions showing a renewed growth of filiform papillæ.

By June 10th the tongue had resumed its customary look.

On August 2d a small area of desquamation similar in characteristics to the preceding appeared on the dorsum, and in two days attained the size of a ten-cent piece. This was followed in a week by another, and a week later by still a third, which rapidly enlarged, covering in a few days the whole posterior half of the dorsum anterior to the circumvallate papillæ, at which time the first patch had disappeared and the second one was rapidly resuming a normal appearance.

On September 1st the tongue would not have attracted attention except for a slight general reddening posteriorly, suggesting that the epithelium was thinner than elsewhere.

On September 12th a new outbreak occurred which was observed from its incipiency. On the dorsum there appeared a circular whitened area about 2 mm. in diameter, slightly elevated, showing on close examination a swelling and whitening of the filiform papillæ. In twenty-four hours this had doubled its extent and exfoliated in the centre, leaving a bright-red smooth surface with an elevated narrow, whitish border. In twenty-four hours this border for half its circumference had disappeared, but its remaining half continued to enlarge and in its subsequent history repeated the phenomena of its predecessors.

There were practically no subjective symptoms referable to the tongue.

No evidence was obtainable of syphilitic, tubercular, or rheumatic disease in the patient or in her family.

*Pathological anatomy.* In a section taken at right-angles to the elevated border, thus including normal tissues on the one side and the desquamated area on the other (hardened in Mueller's fluid, imbedded in celloidin, and stained in hæmatoxylin and eosin), the following conditions are evident: Immediately in front of the elevated border and before any surface-alterations can be perceived, a narrow, compact wedge of polynuclear leucocytes is seen in the superficial layers of the rete mucosa, being a direct prolongation of a compact mass of leucocytes which occupies the region of the elevated border, infiltrating the epithelium for its whole extent and dissecting up its superficial layers, extending also in a scattering fashion to the deeper layers of the rete mucosa. In the infiltrated area the tissue-cells appear swollen, the nuclei stain faintly or not at all, while at the elevated border the superficial epithelial cells are exfoliated in coherent masses. As soon as exfoliation has occurred the infiltration subsides, and at a distance of two or three millimetres from the elevated border only a few scattering leucocytes are met with. The lower three or four layers of epithelial cells escape desquamation, but their nuclei stain faintly or not at all. At a distance of three to four millimetres from the border a new layer of epithelial cells appears with sharply staining nuclei, and from that point regeneration of the epithelial covering slowly proceeds. In the desquamated areas nothing is left to mark the seat of the filiform papillæ, except in the case of the larger ones, where a layer or two of intact epithelial cells indicates their former point of attachment. The fungiform papillæ part with their epithelial covering, but otherwise are left unaffected.

CASE II.—A. B., female, married, aged forty-nine years, Nova Scotian. On October 12, 1895, patient came for soreness of tongue with neuralgic pains, excited by hot or irritating food, coming on five months ago and increasing since, although varying in intensity, aggravated by irritating ingesta, and attended by the presence of whitish lines and raw patches on the tongue. The appearance and history of the patient indicated chronic invalidism of a dyspeptic and uterine type, with frequent pains in back, apparently of a rheumatic nature. Nutrition and color were fairly good. On the dorsum of the tongue, just in front of the circumvallate papillæ, were two conspicuous areas, reddened and smooth, containing reddened fungiform papillæ, but denuded of filiform papillæ except for the merest stump-like vestiges. Each area for half its circumference was bounded by a narrow, slightly elevated whitish line of swollen papillæ, and for the remaining half of its circumference exhibited a gradual transition to normal tissue. With the exception of the preservation of distinct macroscopic traces of the filiform papillæ, the clinical picture presented by these areas was entirely similar to those in the preceding case.

Anteriorly on the dorsum the left side was occupied by a sharply defined area of an elongated oval shape, distinguished from the neighboring normal tissue by its redder coloration, by the presence of numerous irregular furrows and wrinkles, and by an alteration in both forms of papillæ, the filiform appearing shortened, thickened, and reddened, the fungiform also reddened and symmetrically increased in size. Traversing this area, generally at right-angles to its long diameter, were several irregularly curved whitish lines, seen on close inspection to consist of one or two rows of markedly enlarged papillæ, each papilla covered by a thin whitish layer, removable by gentle scraping. Immediately behind the concavity of each curved line the papillæ appeared more swollen and more brightly reddened than those adjoining the convexity, suggesting very directly that the process travelled in the direction of the convexity.

In the course of the next two months repeated examinations showed a gradual shifting in position of the whitish lines with their attendant papillary changes. As previously noted, the more delicate filiform papillæ in the posterior half of the dorsum were stripped for nearly half their whole length, while the stouter ones nearer the tip lost only their upper portions, preserving very distinctly broadened and reddened stump-like bases.

Examination of two specimens excised from the anterior portions of the dorsum showed similar appearances.

The alterations forming the macroscopic margin of the process consist in a sharply circumscribed compact aggregation of polynuclear leucocytes in the upper layers of the rete mucosa, exhibiting a progress in the direction of normal tissue as a narrow cuneiform prolongation beneath the epithelium; the infiltration at the seat of its greatest intensity being attended by a separation and exfoliation of the epithelial cells, so that leucocytes are seen escaping from the denuded surface of the rete mucosa. At the same time the tissue-cells of the affected area appear swollen and stand apart, with intervening deficiencies suggesting an exudate, while their nuclei stain faintly. Behind the point of exfoliation the infiltration rapidly subsides and the tissue-cells resume their customary appearance, while the macroscopically reddened surface is seen to have retained only the lower two or three layers of its epithelial cells. The leucocytes are seen to occur in a scattering fashion as far as the submucosa.

CASE III.—M. H., female, married, aged thirty-seven years, American. Previous history negative except for a right facial paralysis of eight years' standing, of uncertain origin.

In October, 1894, patient came to clinic for acute pronounced swelling of both submaxillary glands, of four days' duration, attended by headache, malaise, moderate fever, backache, and by a general soreness of the tongue.

Examination showed both submaxillary glands swollen to hen's-egg size, and slightly tender. The dorsum of the tongue showed along sides and near the tip numerous irregularly curved lines one to two millimetres in diameter, slightly elevated, whitish-yellow, forming the boundary between normal tissue and reddened areas superficially denuded of epithelium, with enlarged fungiform papillæ and shortened, broadened filiform papillæ. Along the sides of the dorsum and near the tip were numerous irregular fissures two to three millimetres in depth, bearing no distinct relation to the white lines.

In the course of a week the glandular swelling and constitutional symptoms diminished, while on the tongue a subsidence of the process was evident, the whitish lines becoming less prominent, many disappearing; the areas of swollen papillæ also decreasing in extent. A distinct but slow shifting of these lines was evident. In the course of a month the glandular swelling had disappeared, the lingual epithelium in general was of normal color, but showed on close examination along the sides of the dorsum and near the tip several curved, whitish, narrow, scarcely elevated lines, seemingly below the superficial layer of epithelium, exhibiting a scarcely perceptible movement from day to day (approximately one or two millimetres per week), while in the rear of their line of march both forms of papillæ were slightly larger than elsewhere.

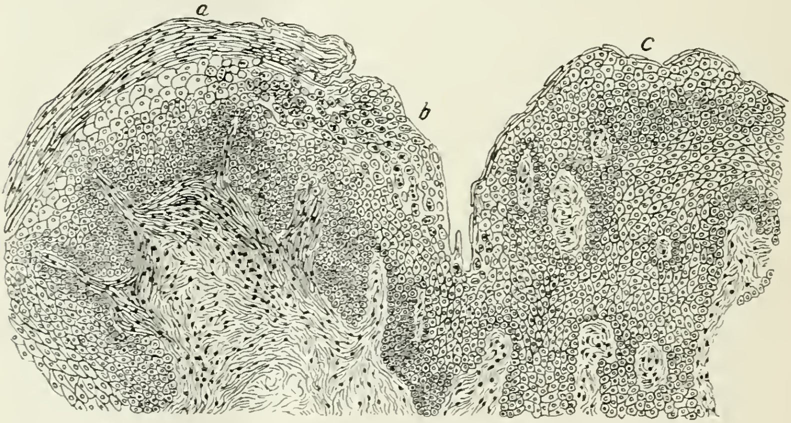
The tongue remained in this quiescent state until July, 1895, when an exacerbation induced the patient to return to the throat-clinic. For several months she had been receiving iodide of potassium on the supposition that the facial paralysis was of syphilitic origin. At this time there were numerous whitish lines distinctly elevated, with a noticeable increase in extent and intensity of the papillary swelling adjoining their concavities. Scattered in the midst of normal tissue were several individually enlarged and whitened papillæ. Moderate soreness of the denuded areas was present, but constitutional symptoms and submaxillary swelling were absent.

From this time until December, 1895, the patient continued under frequent observations, experiencing at intervals exacerbations of the affection, each lasting from several days to a week, and characterized by the whitish lines becoming more prominent, as well as more numerous, and shifting their position with greater rapidity. Except for the occasion above noted, the discrete, whitened, swollen papillæ did not attract attention and must have resumed a normal appearance within a week.

*Pathological anatomy.* Examination of a section taken during an exacerbation through one of the lines of whitened, enlarged papillæ showed appearances in all respects identical with those of Case II., the upper layers of the rete mucosa being at this point the seat of an infiltration of leucocytes, attended by swelling of the tissue-cells and œdema, leading to softening and exfoliation of the epithelium.

Case IV.—A. V., male, aged twenty-five years, single, clerk, American, came to the clinic October 22, 1895, complaining of sore throat of a few days' duration. Previous history was negative, except for several mild attacks of acute articular rheumatism. Admitted venereal exposure, but gave no evidence of syphilis. Tongue always subject to peculiar alterations in appearance without subjective symptoms until eight months ago, since which time it has occasionally been sore. Family history was negative except for a first-cousin, a married woman of thirty-five years, who was stated to have a similar condition of the tongue.

Examination showed fairly good development and nutrition; moderate pallor. Tongue in general of normal color; its dorsum irregularly traversed along the sides and tip by numerous wrinkles and clefts, these regions being also the seat of whitish semilunar lines from one to two centimetres in length, of enlarged filiform and fungiform papillæ; their concavities contiguous to areas in which the clefts are increased in number and depth. In these areas the papillæ are reddened and enlarged, with a roughened surface, apparently denuded of epithelium, this condition in the space of one centimetre or so undergoing a gradual transition to areas but slightly cleft and possessing papillæ of normal color and smoothness, although somewhat enlarged. In all essential details the clinical picture was that frequently presented by Case II.



Case IV.

Frequent observations during the next three months showed a travelling of these white lines over the dorsum at the average rate of one or two millimetres a day. The changes in position were in general irregular and without definite rule, although at times a certain degree of parallelism was apparent, each line being separated by intervals of two or three centimetres from its successor.

At times areas similar to those of Case I. appeared on the dorsum posteriorly, travelling with rapidity and exhibiting a nearly complete denudation of the delicate filiform papillæ of that region. The identity of this condition with that existing anteriorly was occasionally demonstrated by the transition in unbroken continuity of the one to the other; the bright red, smooth, unwrinkled areas posteriorly, with their minute vestiges of the filiform papillæ and reddened, but otherwise macroscopically unaltered fungiform papillæ joining by almost imperceptible degrees to the wrinkled anterior areas with their pronounced papillary enlargement.

Microscopical examination was made of two pieces of affected tissue removed at different times, both being from the dorsum near the side and about three centimetres back from the tip. As seen by the accompanying drawing of a section, the appearances were identical with those of the two preceding cases. The superficial layers of the rete mucosa at *b* are the seat of an infiltration of leucocytes, attended by œdema, necrosis of the tissue-cells, and exfoliation of the epithelium; the process has just left the papilla at *c*, nearly denuding it of epithelium, and is travelling in the direction of the as yet normal tissue at *a*.

CASE V.—F. C. G., male, aged thirty years, married, piano-tuner, American, came in December, 1895, for post-nasal catarrh, and presented a tongue with red areas and swollen papillæ, similar to the preceding. The duration could not be ascertained as the patient was not conscious of any abnormality in the organ. The family history was negative. Patient admitted syphilitic infection ten years ago, with secondary symptoms. There was no history of rheumatic trouble.

A section through an affected area showed microscopical appearances like those of the three preceding cases.

CASE VI.—G. H. D., aged fifty-four years, male, canemaker, came to the clinic for scabbing from recent perforation of nasal septum, probably of a simple nature. No history of syphilis or rheumatism. Duration of tongue-trouble uncertain, the organ giving no subjective symptoms. Family history was negative. Examination showed fairly good development and nutrition. Tongue seemed large for mouth, and presented a dorsum everywhere, but particularly at the sides and tip, covered with deep irregular furrows and clefts, producing conspicuous deformity. The sides and bases of these depressions showed, when spread apart, small flattened papillæ of both forms, evidently a pressure-atrophy, while the free surface of the intervening ridges possessed moderately enlarged papillæ.

Along the sides of the dorsum and extending for about a centimetre or two onto the under surface were irregular, more or less semilunar lines, one to two millimetres in diameter, consisting of whitened, thickened epithelium, forming the boundary between normal or apparently normal tissue and roughened, reddened areas, which in the papillary regions consisted of enlarged, reddened filiform and fungiform papillæ, and on the under side of a reddened, finely granular surface of diminished lustre and translucence.

Sections from this case were unfortunately not made, but no doubt could exist as to the identity of its nature with the preceding. It is presented from its exhibiting a stage of the affection in which the process has involved the dorsum in much permanent disfigurement and extended its seat to the under surface.

In addition to these cases, seven others observed by the writer represented the following ages: 11 months, 3 years, 10, 20, 29, 29, and 34 years. The younger patients were examples of the appearances described under Case I., while the older ones were more or less well-developed instances of the later forms of Cases II., III., IV., and V.

A study of the preceding cases leads very directly to the conclusion that their pathological anatomy consists in an acute inflammation of the upper portion of the rete mucosa, attended by necrosis and desquamation of the superficial epithelium, the process tending to repeat itself, and leading, in proportion to the frequency of its recurrence, to a permanent hypertrophy of the affected tissues.

The appearances necessarily vary according to the natural and acquired characteristics of the structures involved. Thus small and delicate filiform papillæ composed of few epithelial elements readily necrose in their entirety, leaving no trace of their former site. Such are the areas seen in the case of children and young adults. With advancing age these papillæ acquire a stouter constitution, with more numerous and better nourished cells; hence their exfoliation is incomplete, the lower central portions persisting as distinct vestiges. This condition, in virtue of frequently recurring inflammatory changes, passes by a gradual transition to the stage of permanent enlargement. As shown by Case IV., a tongue may present nearly complete temporary stripping of filiform papillæ in its posterior central portions, a region comparatively seldom invaded by the process, side by side with and passing into pronounced papillary hypertrophy at the favorite points of localization anteriorly and laterally.

In the fungiform papillæ the alterations induced by the process differ only in virtue of the different structure of the papillæ, and do not require detailed consideration. The transitory alterations of the first stage pass eventually by imperceptible gradations to permanent enlargement consequent upon hypertrophy of the mucous membrane.

The wrinkles, furrows, and clefts of the advanced cases are the natural result of an enlargement of the mucous membrane without proportionate enlargement of the underlying tissue.

The symptomatology is that of a mucous membrane deprived of a certain portion of its epithelial covering. While in general the exposure of the sensitive nerve-terminals is insufficient to excite subjective symptoms during the performance of the ordinary functions of the organ, yet soreness is more readily excited over the exfoliated areas than elsewhere. This was shown experimentally by gentle curetting. With the exception noted in Case II., symptoms suggesting intrinsic nervous disturbance, such as neuralgic pain, itching, paralysis, atrophy, salivation, or changes in sensibility and taste, were absent in all cases.

Although both the clinical history and pathological anatomy of the cases seemed to indicate a parasitic origin, yet the attempts to discover a specific organism have been thus far unsuccessful. The usual surface-bacteria seemed perhaps unusually plentiful. Sections were stained in hæmatoxylin, in Löffler's alkaline methylene-blue, in carbol-fuchsin, as if for tubercle-bacilli, and by the method of Gram-Günther. The examinations were sufficiently numerous and careful to warrant the statement that the disease is not produced by a bacterium demonstrable by the ordinary methods of staining.

In view of the possible presence of protozoa, scrapings were examined from the surface, both stained and in the fresh state, but with negative result.

There was no constant association of morbid conditions to be noted. Rheumatic symptoms had been present in but two cases. Syphilis was present in two cases, uncertain in five, and almost certainly absent in five. Tuberculosis was noted but once. Gastric derangements were present in nine cases, and absolutely denied in three. Local irritation from carious teeth was present in one case. Submaxillary glandular enlargement was absent in all cases, except for the acute adenitis of Case III., which could hardly have been secondary to the epithelial lesions on the tongue. The occurrence of similar conditions in near relatives was stated to exist in five cases. It was interesting to note that the child of eleven months, with lesions like those in Case I., was the son of a man twenty-nine years of age, who presented appearances similar to those of Cases II., III., IV., and V.

Treatment of the cases was faithfully practised according to methods advocated by different writers, but in no case could any improvement be fairly attributed to the measures employed. In four cases mercury and iodide of potassium, singly and together, were given for some months without effect. Treatment by salicylates and citrates, with restricted diet, was equally ineffectual. Irritant applications, such as chromic acid, produced usually a fresh outbreak of the lesions.

No bibliographical review of the conditions under consideration exists in English, while only incomplete summaries have appeared in French and German. Much of the confusion and diversity of opinion which an examination of the literature reveals is attributable to the tendency of most writers to theorize on purely clinical grounds in the absence of pathological data. In fact, out of the twenty or more authors who have published monographs or reports, only four appear to have made a microscopical examination of the affected tissues.

In 1831 Rayer, in France, described under the name pityriasis of the tongue a lingual affection characterized by epithelial desquamation and consequent formation of red areas, situated chiefly at the base of the organ, and attended by burning and other disagreeable sensations. The clinical details are, however, insufficient to determine with precision just what affection the author had before him.

In 1851 Moeller, in Germany, published an account of a new affection which he called simply chronic excoriations of the tongue, characterized by sharply circumscribed red spots, above which the epithelium is thinned or wanting. At the same time the papillæ are hyperæmic, swollen and thickened, and stand out prominently above the surface. Their seat is particularly the region of the tip and sides, where a severe burning sensation is experienced, preventing the ingestion of even the mildest foods. The condition occurred in six women, of whom five had tapeworm.

In 1853 Betz called attention to an affection similar to that of Moeller, but distinct in that it occurred in five children from four weeks to eight years of age, was characterized by red spots on the dorsum, with acute course repeatedly recurring, exhibiting a desquamation of the filiform papillæ, but preservation of the fungiform, and not attended by subjective symptoms. He considers the process to be ushered in by a hyperæmia of the filiform papillæ without any ulceration, and prefers the name *pityriasis linguæ* to chronic excoriation.

In 1854 Santlus described a lingual affection in a child of two years, which was characterized by a white coating gradually increasing for a period of four to ten days, then becoming membranaceous, cracking superficially and peeling off in shreds, as a result of which the tongue assumed the appearance of a geographical map. In a few days the tongue became of normal appearance, only to be attacked afresh. Salivation accompanied the exacerbations. The process first appeared two weeks after birth. Santlus considered this a histological manifestation rather than a distinct morbid process, to be explained on the theory of a moulting.

In 1864 Bergeron noted the occurrence, especially in children, of areas on the tongue denuded of epithelium, sharply differentiated by their red color from their surroundings and presenting the appearance of a "geographical map." He appears to associate with the above another condition of irregular epithelial thickening, the nature of which is obscure.

In 1869 Gubler gave a careful description of a condition under the name of "*état lichenoïde*," in which small, whitish patches arose on the dorsum of the tongue, proceeded to enlarge and become centrally denuded, thus resulting in the formation of a red spot with a yellowish-white, slightly elevated margin. Dyspepsia and constitutional weakness were associated conditions. Heredity seemed to play a part. The author suggests the possible presence of a specific parasite.

In 1872 Bridou described as well marked and idiopathic a lingual disease ushered in by a slight epithelial thickening anteriorly which exfoliates, leaving small round red spots covered with enlarged papillæ, surrounded partially by a white semilunar margin. The desquamated areas rapidly heal, only to be attacked afresh. The disease began in early childhood, and was generally associated with anæmia and gastric disturbance, but had no special connection with dentition. The author considers this affection identical with that described by Bergeron and

Gubler, but, on the other hand, distinct from the *pityriasis linguæ* of Rayer. He proposes the name "*état tigré.*"

In 1880 Bohn mentioned the occurrence of the geographical tongue, without presenting any new facts.

In 1880 there also appeared an elaborate monograph by Vanlair on *Lichenoïde lingual*, described as occurring in persons of all ages (one a woman of seventy), characterized at the beginning by a diffuse growth of the lingual epithelium, which becomes whitish and soon desquamates, forming roundish red spots surrounded by a compact, narrow, whitish margin. The surface of the red areas was stripped of filiform papillæ; but, on the other hand, the fungiform appeared enlarged and increased in number. The process was limited to the dorsum, except in one case, where it extended to the under surface. Vanlair considered the disease to consist in a subacute inflammation of the papillæ. In the case of the filiform papillæ the inflammatory enlargement produces, according to him, compression of the parenchyma, and more or less complete atrophy results. Since the fungiform papillæ are affected only in their cortical layer, the atrophic process is consequently much less marked. He terms the affection *stamino-papillitis atrophicans.*

In 1880 Caspary described an affection similar to the above, without, however, knowing the French literature. While he found it generally a benign disease of youth, in one instance it appeared sufficiently serious, being associated with and apparently the cause of much local soreness, wrinkling and deep fissuring of the organ, with an extension of the process to the under surface. No constant association with any morbid condition was noted.

The first English account was a report by Barker, in 1880, of several cases occurring in weak children with a tendency to eczema. Itching and salivation were noted once. The type of the affection was that described by Vanlair. The author considered the cause probably the reflex manifestation of a nervous affection.

In 1881 Parrot expressed the belief, as the result of his statistics, that this disease was a manifestation of syphilis. He was the first to describe the histological appearances. In sections he found a thickening of the epithelium, an increase in volume of the cells of the corium and also the Malpighian body, which was also the seat of an active cell-proliferation. In the papillæ and subjacent portions of the derma was a great number of lymphoid bodies, singly and in groups. Parrot regards the derma as the primary and chief seat of the disease, the superficial appearances resulting secondarily.

In 1881 Unna described the disease as exhibiting three stages of development:

1. Scattered patches of simple exfoliation from epithelial swelling and loosening.

2. Red areas of varying shapes, with white elevated margin.
3. A deeper desquamation, giving a terraced appearance, found in two cases.

He considers the affection as purely epithelial in seat, the rete mucosa never being affected. Syphilis played no part, but probably there was some connection with gastric disorders. All of his fourteen cases were young adults. He distinguishes the disease from those exfoliations of the lingual epithelium occupying large areas, often painful, generally transient, not recurring in the same place, and showing by their course that they owe their existence to a wholly irregular exfoliative process, occurring generally at the close of digestive disturbances. His cases of geographical tongue were associated with a desquamative condition of the palms and soles. He considers that these regions exhibit a peculiar preference for this superficial desquamation, although it is possible that the thick epithelial covering of the dorsum of the tongue and of the palms and soles may permit the perception of a condition not apparent on thinner surfaces, although actually occurring there as well. Furthermore, these regions, being richer in nerve-endings than others, may more readily experience disorders of nutrition.

In 1881 Gautier described as follows three types of epithelial desquamation of the tongue, based on his own observations and those already published :

1. A sharply margined form showing no especial thickening of the margin, and only slight increase in size.
2. A festooned variety with thickened serpiginous margin, rapidly changing in size and location.
3. The chronic excoriation of Moeller.

In 1882 Hack confirmed to a certain extent the observations of Gautier, and insisted on the influence of heredity in the production of the geographical tongue.

In 1883 Lemonnier published an excellent account of what he termed *glossite exfoliatrice marginée*, notable also from containing the second observation regarding the pathological anatomy. He found in the lingual papillæ and in the underlying portions of the derma around the vessels a great number of lymphoid corpuscles disseminated or in more or less compact groups.

In 1884 Colcott-Fox reported cases of wandering rash in children, but presented nothing new.

In 1885 Kaposi described as follows, under the name of *glossodynia exfoliativa*, three types of desquamative diseases of the tongue, attended with severe neuralgic pains, occurring chiefly in women of middle age :

1. A faceted desquamation situated along the margin of the tongue.
2. A minute red dotting of the dorsum in consequence of incomplete covering of the papillæ.

3. Sharply margined bald areas, the typical picture of geographical tongue.

In 1885 Butlin, after an excellent clinical account of wandering rash, probably expressed the accepted English views in saying: "And in so far as the disease is scarcely ever observed in adults or even in children over six or seven years old, the probability is strong that it undergoes spontaneous cure, for the only alternative would be that all the children who are affected with it die. . . . I have never seen this serious final stage (drawn by Caspary) nor have met with any other confirmation of it than appeared in the presence of several furrows and fissures along the borders of the tongue of a child who suffered from that disease."

Clinical reports appeared in 1885 by de Molènes on *Desquamation en aires de la langue;* in 1887 by Kinnier on a *Circinate Eruption of the Tongue in Two Children;* by Guinon on *La desquamation épithéliale chez les enfants;* by Hartzell on *Transient Benign Plaques of the Tongue;* in 1888 by Mibilli on *Sulla esfoliatione della lingua;* in 1889 by Bayet, *Sur l'exfoliation en aires de la langue.* None of these presented any new ideas or facts of importance.

In 1889 Besnier described the affection under the title *Eczema en aires de la langue,* expressing the opinion that a connection existed between the affection and eczema seborrhoicum.

In 1889 de Molènes elaborated this view, terming the affection "eczema of the tongue," and considering it to be a manifestation of the arthritic diathesis, similar in its etiology and nature to eczema of the skin. This opinion is supported by him on purely clinical grounds, no pathological evidence being produced. The author expresses his doubt as to the correctness of Lemonnier's histological examination above noted.

In 1890 Michelson reported three cases of the long-neglected condition described by Moeller, and renamed it Moeller's superficial glossitis. All three cases occurred in individuals who had become run down and were suffering from gastric disorders. In two instances tapeworm was found, but in the third was positively absent. Diminution in taste over the healthy as well as over the affected areas was present in two cases. The clinical appearances coincided with Moeller's description, with the addition of the following phenomena: In one case reddened areas were present also on the under surface of the tongue, on the soft palate, and on the mucous membrane of the cheeks and under lip; in another case an eruption of discrete, whitish, opaque nodules of pinhead size occurred and rapidly disappeared again, leaving no traces. He considers the affection distinct from the *lingua geographica* in virtue of its occurrence only in adults, the absence of the whitish border, and the greater degree of permanence shown by the areas of swollen papillæ. A section taken from the under surface near the tip, through one of the whitish nodules of pinhead size above described, gave the following appearances: The *tunica propria* and the upper portions of the submucous tissue were penetrated by a small-celled infiltration. The centre of the specimen corresponding macroscopically to the nodule contained a more compact aggregation of cells, separated by a line of demarcation from its surroundings. The epithelial covering above this collection of cells was entirely absent. The epithelium was thinned over the remainder of the inflamed area, most markedly in the central portions, while a gradual increase in thickness took place toward the periphery. A search for bacteria in the sections by the Gram-Günther and Weigert methods was unsuccessful.

Forchheimer, in 1891, wrote that wandering rash is essentially a children's affection; "further observations will have to be recorded before we can decide whether it extends into adult life." He notes, however, the case of a lady, twenty-four years old, in whom the process began at five, but does not state whether any changes in the appearances had occurred with advancing years.

Schech briefly repeated in 1892 the German accounts of geographical tongue and of Moeller's superficial glossitis, following Michelson in considering them distinct affections.

In 1892 Spehlman reported a series of cases of geographical tongue with an account of the histological appearances, and adding a review of the literature of the subject. He does not discuss the relationship of the disease to the affection of Moeller. Of his twenty-two cases, all but two were under nine years of age. Subjective symptoms and furrowing of the tongue were absent. Sections showed that at those places corresponding macroscopically to the epithelial desquamation the corium was totally wanting. These places were still seen to be the seat of an active process of desquamation, and were covered by a superficial exudate consisting of coagulated albumin, numerous small lymphoid cells, and desquamated, partly disintegrated epithelial cells. The polygonal epithelial cells beneath are markedly swollen, cloudy, and not stained with alum-carmine. In-between lie a few lymphoid corpuscles. These alterations extend to the deepest epithelial layers, so that at the most three or four of the lowest cell-rows of the Malpighian layer remain unaltered. At the periphery of the epithelial deficiency, where macroscopically the wall-like elevation is very often to be seen, the filiform epithelial projections of the *papillæ filiformes* are distorted and enlarged, particularly in their broad diameter, so that they are in contact with each other. At their bases small circumscribed foci of infiltration are visible. The fungiform papillæ lying between the filiform are notably elongated at the expense of their broad diameter, and simultaneously compressed by the filiform projections of the filiform papillæ, situated laterally and altered in the manner previously described. In the intact epithelial covering, as well as in the papillary body of the fungiform papillæ, are scattered lymphoid corpuscles. The papillary layer of the *papillæ filiformes* is somewhat infiltrated ; in the neighborhood of their capillaries as well as in the connective-tissue layer are heapings of lymphoid cells. In individual papillæ are dilated capillaries filled with red blood-corpuscles.

Hahn, in 1892, reported a case of Moeller's superficial glossitis occurring in a hypochondriacal married woman of twenty-five years, who presented the typical lesions as described by Moeller, associated with lingual pain of a neuralgic character. The affected areas seemed to be in proximity to two carious molars, although the removal of the teeth was not followed by benefit. The author notes the absence of mention of the condition of the teeth in the cases reported by Moeller and Michelson. Search for tapeworm was negative.

From the preceding accounts it may be seen that four types of lingual desquamation have been described, namely :

1. The condition called wandering rash.
2. The superficial glossitis of Moeller.
3. The circumscribed bald areas of irregular occurrence and course, described by Unna.
4. Desquamations of various types attended by neuralgia and hyperæsthesia, described by Kaposi as *glossodynia exfoliativa.*

In a comprehensive consideration of the phenomena represented by these types the question presents itself, What is the relation of the nervous manifestations both to the macroscopical alterations and also to similar nervous symptoms unattended by local lesions?

Kaposi mentions the occurrence of lingual neuralgia with geographical tongue, and calls this affection a form of *glossodynia exfoliativa ;* but the association has been noted by no other observer. It seems, therefore, impossible to avoid the conclusion that their simultaneous occurrence is accidental.

The superficial glossitis of Moeller is represented in literature, so far as I am aware, by the records of ten cases, in all of which nervous symptoms were present. Nine of them were women of or near middle age, a class of individuals peculiarly liable to lingual neuralgia and hyperæsthesia. In some instances it is distinctly stated that the pain did not stand in relation to the lesion as regards seat, and that while distress was excited by movements of the tongue and contact with irritating substances, the locally altered areas were not more sensitive than the apparently healthy ones. In view of these facts, and since, moreover, it is possible that a rare painless and comparatively inconspicuous alteration of the lingual epithelium could have failed to attract attention until by simultaneous occurrence with severe nervous symptoms close examination of the organ was demanded, a coincidental association of the two conditions in these ten cases seems not impossible.

If the possibility be once admitted that the pathology of the conditions reported by Moeller, Michelson, and Hahn does not necessarily comprehend a painful derangement of the nerves, it follows obviously that cases presenting identical histological and clinical appearances must, although unattended by hyperæsthetic symptoms, be considered instances of Moeller's superficial glossitis.

Reverting now to the cases described by the present writer, it will be observed in Cases II. to VI that macroscopic alterations were present corresponding to those stated by Moeller to be characteristic of his affection. In Case III., also, attention should be called to the occurrence of whitened, swollen, isolated papillæ, which were noted and recorded by the writer previous to reading Michelson's account in his second case of an eruption of discrete, whitish, opaque nodules of pinhead size, which arose and rapidly disappeared again.

Furthermore, as regards the pathological anatomy, a comparison in Cases II. to V. of the histological appearances seen in the sections made by the writer with the description of Michelson's specimen, reveals no essential points of discrepancy, both exhibiting an inflammation of the superficial layers of the corium, attended by necrosis and exfoliation of the superficial epithelial cells.

The conclusion appears therefore inevitable, in the present state of our knowledge, that the cases numbered II. to V. of the present writer cannot be considered as other than instances of Moeller's superficial glossitis, although the macroscopic lesions representing this condition passed at times inseparably into others characteristic of wandering rash. If, as seems now to be indicated, these two conditions under discussion are identical in nature, this identity should be made apparent by an appropriate designation. In the present state of our ignorance of the etiology terms implying a knowledge of origin or suggesting an analogy to cutaneous phenomena are manifestly unscientific. While the privilege of permanently naming the disease is to be left to the discoverer of its cause, a temporary appellation seems desirable. The writer suggests for this purpose the term superficial wandering glossitis, *glossitis superficialis migrans*, as distinctly descriptive, while keeping within limits of pathological facts.

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# MASSAGE, MOVEMENTS, AND BANDAGING IN THE TREATMENT OF DISPLACED SEMILUNAR CARTILAGES.

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IT would seem as if Nature had been somewhat negligent of her work in placing a couple of *buffers* between each knee-joint that are so easily displaced as the semilunar cartilages seem to be in some people. Many of us have doubtless supposed that these cartilages are firmly attached by their under surfaces to the head of the tibia, and this has but deepened the mystery of their displacement. It may be worth while to review briefly their anatomy and physiology, which must have become exceedingly rusty to many of us since our student-days.[1]

Situated on the head of the tibia and covering the anterior two-thirds of the corresponding articular surfaces, held in place by their attachments in front and behind the spine of the tibia, and further fortified by the coronary ligaments in front, the internal lateral ligament on the inside, and by the popliteus muscle on the outside, it would seem almost impossible for the semilunar cartilages ever to slip out of place. Concave on their upper surfaces for adaptation to the condyles of the femur so as to facilitate flexion and extension, and lined by synovial membrane, not only above, but (what some recent writers seem to have forgotten with the rest of us) also on their under surfaces as well, in order to permit rotation between them and the head of the tibia, the complexity of this joint strikes us as something wonderful, even though we have been used to it all our lives. Morris gives us by far the best description of these cartilages that I have yet been able to find: "They lessen the shock and jar of walking, running, and jumping; they fill in the intervals between the articular surfaces of the femur and tibia, which during extension are slight, but during flexion are considerable. They deepen the facets of the tibia for the condyles, and for this purpose they are less fixed at their forepart than behind, so as to be able to close in upon the spherical portions of the condyles in flexion, and to slide forward and be squeezed out *into large circles* by the anterior, nearly flat portions of the condyle in extension. This adjustment of the fibro-cartilages to the condyles of the femur in the varying positions of the joint is due partly to their own tendency to shift, partly to their connections, and partly to the pressure and pull of surrounding parts. In flexion and extension the cartilages move with the tibia upon the femur. In supination and pronation the tibia moves upon them while they remain unaltered in their position to the femur; the outer cartilage is steadied chiefly by the pressure of the popliteus (the muscle chiefly concerned in rotating the tibia inward or pronating the leg) against the outer margin of the cartilage while it is acting upon the tibia."[1]

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[1] Dr. Oliver Wendell Holmes used to say that he would not like to be examined on the muscles of the back in summer-time.

I fear that it requires a more brilliant imagination and delicate touch than most of us are possessed of to appreciate "the large circles" that the semilunar cartilages are squeezed into by extension, as well as to realize the statement of Dr. Scott Lang, that "in a perfectly sound knee the internal semilunar cartilage can be distinctly felt to recede when the knee is flexed and to come forward in extension on the antero internal aspect of the joint." Even when all the indications point to displacement of semilunar cartilages, oftener than not these cartilages cannot be felt, as in the three following cases, which were evidently due to dislocation of the internal semilunar cartilage:

Case I.—On April 12, 1886, Mr. C. came to me. He was twenty years old, thin, wiry, and muscular, but somewhat loose-jointed. Two years before this, when jumping, he said, "he put his right knee out of joint," but he kept walking about on it, though it pained him much for several weeks. Twice afterward he did the same injury to it, though less severely, and he had had several "kinks" besides. Three days before he came to me he had twisted it as badly as at first, and he was obliged to walk on tiptoe with knee semiflexed. The day after the accident he went to one of our large hospitals, where he was told that a cartilage was out, and he was worked over for a while with a view to getting it back, but without avail. He came away from the hospital with the knee enveloped in cotton-batting and a bandage over this, and continued to hobble as before. The pain was referred to the inner aspect of the knee, which was tender on pressure, and any attempt to extend the leg increased the pain. The tissues around the knee seemed relaxed, but there was no effusion or swelling, and undue projection of the internal semilunar cartilage could not be made out, though the symptoms all pointed to such an injury. Flexion caused no pain, and while the leg was flexed I pressed firmly with my thumb over the painful spot and extended the leg quickly, and repeated this a few times, with the result of getting the leg extended. This procedure was somewhat painful, but by allowing him to rest a few minutes while using massage, and then repeating the same movements of extension the pain decreased. Then I pushed strongly with the heels of my hands over the natural depressions in front of the knee-joint whilst the leg was flexed, and told him to extend it vigorously. After this, free and gentle passive motion was used and well tolerated. Placing a pad formed by a few folds of bandage over the inner aspect of the knee, I applied a bandage firmly over this and around the knee, and the patient walked off almost naturally with but a slight limp, half an hour after he came to me. In standing he could not fully extend the leg, but it was as straight as a leg is required to be for walking. He returned the following day and I gave the knee massage and gentle passive motion, while exerting pressure over the inner aspect of the joint. I applied a splint to the back of the leg and thigh, but he soon returned with it, saying that the bandage and pad alone were much more comfortable and supporting. I have not seen him since. I have been told by his friends that he has not had any return of his mishap. No doubt he was a little lame after I saw him.

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[1] Anatomy of Joints, by Henry Morris, London.

CASE II.—Miss A. was nineteen years old and weighed 130 pounds when she came to me in June, 1894. Ten months before this she had been running down hill where the ground was rough, and suddenly she felt something slip on the inside of her right knee. The pain was momentary and she managed to walk home with difficulty—a mile and a half. Two weeks after this it slipped again; the leg was semiflexed, and her physician did not succeed in getting it extended. He kept it in a splint for a fortnight and gradually straightened it. After this it seemed well for several days, but soon slipped again going downstairs, and she did not step with it for four weeks. She then went to New York and consulted an orthopædic surgeon, who put it in plaster-of-Paris for three weeks, and after this in a metallic brace, which did not seem to fit very well, for she wore it only for two days. After this another slip, followed by effusion and a lay-up for ten days. The swelling soon disappeared. She has had several more slips since, some of them on slight provocation, as when sitting with the lame leg partly crossed over the other below the knee and allowing it to roll outward by its own weight would cause the disturbance to reappear. She has always distinctly felt something slipping out at the inner aspect of the knee when she has made a misstep, or done anything to twist the leg out.

Latterly, by keeping quiet for five minutes or so, she could sometimes feel it slip back; at other times she could only infer that it had gone into place because she felt that she could use it, though it was a little lame and sore for a day or two after. Five weeks before she came to me she stubbed her toe and had a more severe relapse than usual. She had worn a plaster-cast almost continuously for seven or eight months, removing it occasionally indoors. She was much discouraged and in despair of ever being able to lay aside entirely the plaster-cast.

On examination I found slight periarticular thickening on each side of the ligamentum patellæ, but no effusion in the joint. Passively rotating the leg outward caused discomfort on the inside of the knee, but inward rotation did not. Extension was natural; flexion but one-fourth natural, and on attempting to bend it further pain was produced at the anterior aspect of the internal condyle. No undue projection of the internal semilunar cartilage could be made out. Though this patient and her relatives were of the highest intelligence, yet none of the physicians who had seen the case vouchsafed to tell them what they thought was the matter with the knee, which must have been sufficiently evident from the history alone. The whole leg was smaller than the other, as shown by the following circumferences: right knee, 13 inches; left, $13\frac{3}{4}$; above knee, right, $12\frac{1}{2}$ inches; left, $14\frac{1}{4}$; below knee, right, $12\frac{1}{4}$ inches; left, $12\frac{1}{2}$; right calf, $12\frac{1}{2}$ inches; left, $12\frac{7}{8}$; right thigh, $17\frac{1}{4}$ inches; left, $18\frac{7}{8}$.

Restrained muscular action, disuse, and the pressure of the cast accounted in great part for the smaller size of the right leg, though it might always have been somewhat smaller than the other. Extra use of the left leg probably made it larger. But notwithstanding the apparent atrophy of the quadriceps extensor muscle she could hold the leg extended for twenty-five seconds, and this was immediately seized upon as an exercise to strengthen these muscles; and with this object in view she was advised to extend the leg six times three times daily, and to increase this once daily. The whole limb was *masséed* daily, and more especially the muscles of the thigh; faradism was applied to the quadriceps extensor, flexion was gradually increased, while firm pressure was made over the inner aspect of the knee; and after these a bandage was firmly applied around the knee and over a pad on the inside. Even after the first sitting of this kind the knee and whole limb felt much invigorated, and after the second the plaster-cast was laid aside entirely, as the knee felt much better supported by the pad and bandage, which had never been applied by anyone else before, and which gave greater feeling of security and allowed more freedom of motion than anything that had been applied. In four days the feeling of stiffness had disappeared and the leg could be bent to a right-angle. The knee continued to gain in strength, move easier, and feel more comfortable. In eleven days she could hold the leg extended one minute and a half; in thirteen days, two minutes and ten seconds; and later she could hold it for four minutes, with corresponding improvement in other respects. In order to improve flexion she was told to hold on to the mantel-shelf and get into a squatting position three or four times a day. To prevent a repetition of her accident she was advised to walk with the knee extended and toes turned out, so that the muscles would not be caught off guard, and very soon after she began walking this way a *lumax* of a man stumbled against the inside of the great toe of the leg in question, but without doing any harm to the knee. With the hope of further strengthening the tissues on the inside of the knee and thigh, we tried resisting adduction of the thigh with the knee semiflexed; but the sensations produced quickly made us aware that we were on the wrong track, even though my hand pressed firmly over the inner aspect of the knee as she moved it inward. This is the motion that throws the internal semilunar cartilage out.

Under daily treatment for four weeks the knee improved and felt strong all the time, and she was encouraged to walk, toes out, indoors without the bandage. She then went to the seashore, and visited me two or three times a week for the next five weeks. I allowed her to go bathing and swimming with a rubber bandage on as a precaution. At the seashore she had to go up and down two flights of stairs on foot, and this seemed to improve the bending of the knee, so that it bent past a right-angle, and soon she was able to run on the beach, to dance, and to go down stairs naturally, though not easily, which is the most difficult exercise for weak, lame knees. Ten days before she passed from my care we feared that our labors had been brought to naught, for while she was sitting on a trunk the lid suddenly slipped closer. In her alarm she jerked the leg violently and the old feeling returned as if something was out of place. She pressed firmly over the inside of the knee and extended it, as I had previously shown her how to do in the event of a relapse, but without improvement. She could not fully extend it. She applied the pad and bandage tightly and this gave relief. It was lame and uncomfortable for only a day after, and this might be interpreted as evidence of more rapid recuperative power. Three days afterward it could be flexed further and easier than before the accident on the trunk, and it also allowed full extension. This was probably due to rupture of adhesions which we had been more slowly and safely trying to accomplish. A week later, under massage, bandaging, and electricity, she had more than regained what she lost by the last mishap, so that flexion was almost natural, but descending stairs was still a little irksome.

Two months later she wrote me that she was walking three miles a day and riding horseback with an ordinary saddle, a position that would seem unfavorable for the right knee. She had not worn the bandage for a month, and the knee felt strong without it. She could run down stairs and the stiffness had all disappeared. Three months after this I heard from her again, that she could walk, dance, and ride a bicycle without any trouble, and wanted to know if she might skate, to which I replied, "Yes."

Case III.—Mr. C. E., fifty-two years old; weighs 190 pounds; is strong and athletic, and has no surplus fat. Three weeks before he came to me, on September 12, 1894, his right foot caught in a croquet-wicket and he hurt his knee. It was semiflexed and painful, and attempts to straighten it were not successful. His physician did it up in plaster-of-Paris for three or four days, and after that he hobbled about with it partly flexed. Slight, unexpected eversion of his foot had often thrown something out at the inside of his right knee, and this had frequently occurred in bed. But he had always been able to twist and extend the leg himself in such a way that he could feel it slip back again, until this last time. The knee had bothered him in this way for ten years.

On examination there were found slight effusion and heat and some periarticular thickening, and the muscles on the front of the thigh were soft and flabby as compared with the same muscles of the other thigh. No projecting cartilage could be felt. Massage and snug bandaging with a pad over the inside of the knee, passive motion with firm pressure over the seat of the internal semilunar cartilage every day for a few days, and later every other day, with home exercises of extension and flexion, and in two weeks he had good use of the knee, and could go up and down stairs, and in two weeks more he had resumed riding his bicycle.

These patients were delightfully surprised at the comfort and support of a bandage with a pad under it, in comparison with the discomfort and lack of support of splints and plaster-casts.

Case IV.—I do not know whether this case was one of displacement of the external semilunar cartilage or not. The manner in which the accident occurred and the previous history would lead one to think that it might have been. It was that of Miss H., eighty-one years of age, well preserved, of medium stature, who looked to be not more than sixty, and who had never been sick a day in her life. Ten days before I was called to her, while she was ringing her door-bell, which was on the left of the door and pulled hard, she lost her balance and swayed around to the left. Her left knee had since been swollen and motion difficult. The knee was weak and stiff, bowed outward, and foot turned inward, and she walked with the aid of a crutch, sliding the foot along the floor. She could not go up or down stairs. No effusion could be made out in the cavity of the knee-joint itself, but there was much effusion above the joint, bulging out on each side of the tendon of the rectus femoris. Evidently the synovial bursa beneath the quadriceps extensor was shut off from the cavity of the joint, as is sometimes the case. On placing a thumb and finger on each side of the ligamentum patellæ while moving the leg, there was a feeling and sound as of dry, creaking leather, not perceptible in the other knee. In the previous twelve or fifteen years her left leg had been gradually changing its outline, so that it bowed out at the knee and in at the foot, but without any discomfort. There was great relaxation of the attachments of the knee both on the inside and outside, as shown by the ease with which the leg could be bent externally and internally. When the ankle was pulled externally, and the knee pushed in, the space between the inner condyle of the femur and the internal tuberosity of the tibia was much greater than that of the other leg, evidently due to absorption of the articular surface of the inner condyle; and, confirmatory of this, the leg when extended was straight antero-posteriorly, whereas in the natural condition it ought to have deviated slightly in at the knee and out at the foot. When the foot was pulled inward and the knee pushed outward it was astonishing to what extent the outward bending went, and this produced discomfort at the inner aspect of the joint and was attended by a noise and feeling as if the spine of the tibia were slipping in and out of place. Altogether it was a curious and interesting knee.

The effusion in the synovial sac under the quadriceps extensor rapidly disappeared under massage every other day, and a bandage worn in the intervals. After the first massage it was three-eighths of an inch less in circumference around the seat of the swelling, and in two weeks it was all gone. Moderate efforts at rectifying the position of the leg were of no avail. After the effusion had disappeared the problem seemed to be that of strengthening the limb, and for this purpose resistive movements of pushing and pulling while the patient was lying down were alternated with the massage. She exhibited unusual vigor in pushing and pulling the leg against the resistance, which increased our wonder at her inability to use it better when in the perpendicular position. After three weeks of this there was no improvement in walking, notwithstanding increase of strength in flexing and extending leg and thigh against resistance while lying. Thinking perhaps she might be able to walk better if we could get the quadriceps extensor muscles strengthened, we found at the first trial that she could hold the leg extended for one minute, an unusually long time to begin with. After five minutes of massage to the quadriceps extensor she held the leg out for one and a half minutes. Two days later two minutes before massage, and three minutes after. But still no improvement in walking. A well padded ham-splint was faithfully tried and afforded neither support, ease, nor comfort.

A year or two later I called to see this patient, and learned from a relative that she had died of pneumonia, and that several months after I last saw her the knee had rectified itself so that she could go up and down stairs naturally.

Text-books on surgery are wofully deficient in information concerning displacement of semilunar cartilages. The best monographs on the subject are by Dr. Scott Lang and Herbert W. Allingham, and from these we learn that the semilunar cartilages may slip forward, backward, inward, or outward. The internal semilunar cartilage is the one most often at fault. As to the symptoms in general, the knee is usually semiflexed and cannot be extended; but flexion is usually free in recent cases. The foot is turned outward when the internal semilunar cartilage is displaced; inward when it is the external semilunar cartilage. In most cases little or nothing abnormal can be seen or felt about the joint, except the semiflexion and a little tenderness at the head of the tibia. Rarely can the cartilage be felt projecting, and even when it does synovitis may supervene in a few hours and mask the symptoms.

As to the causes: Though any violent accident may produce internal derangement of the knee-joint, yet most cases would probably coincide with Dr. Knott's instructive description of his own case: "It has always been the result of a very slight, and in every instance an indirect violence. This violence has always been applied so as to produce a twist at the knee, either of the leg outward or of the femur inward. The most common cause has been striking the inside of the great toe against something when the knee has been slightly flexed, the parts about the joint as relaxed as possible, and the muscles thrown off their guard. I never suffered any derangement when the limb was in a decided state of active motion."[1]

The whole subject has been still further elucidated by Dr. Scott Lang in the *Edinburgh Medical Journal* for 1886–87, who points out that the internal semilunar cartilage is displaced in rotation of the leg outward combined with flexion; the external semilunar cartilage in rotation of the leg inward combined with flexion; and that the injury is caused by some sudden and almost involuntary movement when the muscles governing the joint are off their guard, or fail to act in concert with one another. A lax condition of the ligaments and muscles of the knee-joint from general debility or previous synovitis would predispose to these accidents.

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[1] Dublin Quarterly Review, 1882, p. 489.

Laying aside cases that require surgical interference by cutting into the joint, the indications for treatment must be very clear. Restore the cartilage to its natural position, if possible. Retain it there. Strengthen the joint and muscles so that they will be less likely to be caught off guard. Various suggestions are made as to the methods to be pursued to replace the semilunar cartilage. When one fails another is tried. The methods that seem to be most relied upon are: flex the leg as much as possible upon the thigh, then rotate the tibia inward if the inner cartilage is displaced, outward if the external, and extend the leg quickly upon the thigh while pressing with the thumb where the cartilage is supposed to be out of place. The opposite procedure, extension, then flexion with pressure, sometimes succeeds. As it may be very difficult to ascertain whether a cartilage has slipped out of place or not, Dr. Samuel J. Mixter has made the very shrewd suggestion that every case of sprain or twist of the knee should be put through the movements of replacing a dislocated meniscus. But if a semilunar cartilage is not displaced, it is very evident that such a procedure would hurt the patient unnecessarily, and be very likely to aggravate a sprain of this joint, and if a semilunar cartilage were not displaced, such movements might put it out in a sprained knee.

With regard to the second medication, it does not seem to me that a ham-splint or a plaster-cast is so direct and effectual in retaining a semilunar cartilage and supporting and comforting the knee as a pad with a snug bandage over the offending region Moreover, there would seem in some cases, at least, to be a tendency of these cartilages to slip back into place even when attempts to readjust them had failed; but if the joint is immovably fixed by a ham-splint or plaster-cast, its power to adapt itself to a return of the cartilage by gentle change of motion is prevented, which is not the case with a pad and bandage. For the relief of the heat, pain, and swelling that result from a sprain, wrench, or twist, massage properly applied is most satisfactory. For the preservation of the circulation and nutrition of the muscles and the prevention of atrophy, massage applied early has proved to be quite effectual.

As displacements of the semilunar cartilages are most likely to occur when the muscles are off guard, so to speak, our endeavors should be to strengthen these muscles so that they will not be "caught napping." I imagine that the behavior of muscles in this manner is due in great measure to a loss of "muscular sense," the restoration of which is promoted in an astonishingly agreeable manner by means of massage, which at the same time helps to bring back the automatic action of will and spinal cord in presiding over these lazy sentinels. And this will be still further aided by alternating massage with carefully graduated movements of pushing and pulling, and of voluntary efforts of holding the leg extended. A few minutes' application of the faradic current to the quadriceps extensor muscles immediately after the massage sometimes seems to have a more invigorating effect than either alone, and, moreover, the contractions caused by the faradic current are but another and useful form of motion—semi-active, semi-passive.

Walking with the foot turned inward is considered to be a good precautionary measure when the internal semilunar cartilage is liable to slip out of place, with the foot turned out when the external cartilage is likely to slip, according to Scott Lang; but as either of these positions allows all the more latitude for rotation in the opposite direction when the knee is semiflexed, it can only be safe so long as the patient receives no violence to throw the leg in the opposite direction; whereas, if the patient walks with the foot turned out and knee extended, where it is a question of preventing dislocation of the internal semilunar cartilage, then, as it is already in the position where the cartilage is liable to be displaced, but with the muscles on guard, unexpected violence is resisted, and the range of motion that would be dangerous is reduced to a minimum, as was the case with the second patient reported in this article.

In cases that have required operation for the removal of the semilunar cartilages, or for stitching them in place, the joint is generally stiff for some time afterward. As soon as two or three weeks after the operation Dr. Allingham recommends daily massage and passive motion; and later that the patient should try to sit on his heels. A much safer plan than the latter is for the patient to hold on to something, such as the mantel-shelf or foot of a bed, so as to graduate and control the weight upon the knee.

Full of significance are the following words of Dr. A. Logan Turner in his article on "Internal Derangement of the Knee-joint," in the *Edinburgh Hospital Reports*, 1894 vol. ii.: "In order to gain some idea as to how soon after operation a man may return to his work, one must take into consideration the nature of the occupation, the length of time during which splints have been worn, and the amount of care which the patient gives to massage and movement."

From the foregoing the following conclusions would seem to be justifiable:

1. That neither in their natural or unnatural positions can semilunar cartilages often be distinguished from the surrounding tissues.

2. That the position of the leg affords the best means of inferring whether one or the other semilunar cartilages may have been dislocated when it cannot be felt; the leg being usually flexed and the foot turned out when the internal meniscus is dislocated, the leg flexed and the foot turned in when it is external.

3. To attempt to replace a dislocated semilunar cartilage it is wise to flex the leg, then extend suddenly, rotating the leg inward if it be the internal cartilage, outward if it be the external, while exerting pressure over the offending region.

4. That there is a natural tendency in some cases of dislocated semilunar cartilages to slip back into place when the leg is not artificially restrained.

5. That if the knee be immovably fixed by plaster or splints before the cartilage has gotten back into its natural situation, the joint is locked and restrained from gentle instinctive movements that might favor its return.

6. That cases of displaced cartilage are attended by voluntary and involuntary restraint of motion on account of pain and mechanical impediment; and in some cases by synovitis and the formation of adhesions. Forcible passive motion might then have the double purpose of breaking the adhesions and rectifying the displacement, as probably occurred in Case III. of this article.

7. That even after a meniscus has been restored to its natural situation, it is not so securely and comfortably held by plaster and splints as by a pad of a few folds of bandage and a figure-of-eight bandage applied over this, which affords support and comfort and a safe limit of motion.

8. That it is possible by carefully applied massage, resistive movements, home exercises, and electricity so to strengthen the muscles on the front of the thigh, the fascia, ligaments, and attachments of the knee-joint that they will safely hold a previously dislocated semilunar cartilage without artificial support.

9. These remarks do not apply to cases requiring surgical operation, though the above mentioned combination of treatment might be safely tried in some cases before cutting into a knee-joint, but more especially after operation for restoring motion and strength to the knee.[1]

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[1] Read before the Brookline (Massachusetts) Medical Club. Dr. Sabine, the President of the Club, said "that when a boy he was brought up on a farm, and when milking frequently one of his legs would get painfully flexed under the other, with foot turned in. It hurt severely to extend it, but when once extended it seemed all right. One time when he was swimming the accident occurred, and was followed by an attack of acute synovitis, after which he got all over it, and had no return." In all probability the effusion allowed the displaced cartilage to get completely back into its natural position, an event that would not have been likely to take place if the leg had been put up in splints or plaster-of-Paris.

# THE ETIOLOGY AND TREATMENT OF VENEREAL BUBOES.

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So much has been written on this subject, and so many able observers have published results of their investigations, that it is with hesitancy that I commence this article; still, I think the causation and comparative treatment of bubo are of sufficient interest to warrant the placing of another paper on this subject before the profession.

As the small indolent buboes following chancre are not a complication, but an evidence of systemic infection, and rarely suppurate or cause any inconvenience, they will not be considered in this article.

Lymphadenitis is a somewhat rare complication of gonorrhœa, and when it occurs is probably due to the absorption of chemic poisons, the result of a mixed infection. The frequency of gonorrhœal buboes is shown by the following statistics compiled from the reports of the U. S. Marine-Hospital Service:

Table I.

| | |
|---|---|
| Cases of gonorrhœa | 13,774 |
| Number of buboes occurring in these cases | 341 |
| Percentage of buboes to total number of cases of gonorrhœa | 2.48 |

Armstrong[1] states that these complications occur in 2.7 per cent. of cases of specific urethritis. My individual records show a percentage of 2.8.

This brings us to the consideration of the cause of the majority of buboes, and, since the soft chancre is this exciting factor, a few words concerning its etiology will be appropriate in this connection.

It is a mooted point whether a chancroid is due to a specific germ; some careful observers claim it is, while other equally prominent investigators say it is not.

Ducrey[2] states that he has found a microbe that is constantly present in chancroidal pus, which he believes to be the exciting cause of chancroid. He describes the germ as being a rod-like bacillus, occurring singly and in chains; when in the tissues almost always in chain-form. His observations are confirmed by Unna, Krefting, and others.

The crucial test of the propagation of pure cultures that would cause the disease has failed. These gentlemen have claimed to have propagated the specific germ on the patient himself for five or six generations, and to have finally gotten pure cultures. On the other hand, many eminent men deny that chancroid is due to a specific germ, and Finger[1] says that if this strepto-bacillus is the exciting cause, it is nothing more than a pyogenic microbe.

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[1] Medical News, December 5, 1885.

[2] Comptes Rendus du Congrès Internat. de Derm. et de Syph., Paris, 1889, p. 229.

Taylor[2] claims that the soft chancre is not due to a special virus, and says that it may be produced by simple pus, pus from irritated syphilitic lesions, and believes that this disease can originate *de novo.*

We all know that bubo is a frequent complication of chancroid, and that it may follow the most insignificant lesions, while it is often absent when the destructive process is most active. In fact, there is no relation between their frequency and the clinical features of the ulcers.

There is no particular time for a bubo to develop; it may occur at any time during the course of the chancroid or some time after it has healed; hence all cases attributed to strain, etc., should be looked upon with suspicion, as a rigid examination will generally trace them back to an antecedent chancroid. I have had several cases under my care in which the bubo developed after the ulcer of the penis had completely cicatrized.

The frequency of this complication is shown by the following statistics: Sturgis[3] states that in 249 soft chancres bubo occurred in 71, a percentage of 28.5. Ricord's statistics, as quoted by Sturgis, give the frequency of bubo as 31 per cent. Szadex[4] reports 1084 cases, among which were 274 buboes, or about one bubo in four chancroids. Martin[5] says that the record of his venereal service shows that this complication occurred in 19 per cent. of 162 chancroids, but that these were cases that applied to hospitals for treatment, and that among the higher classes who observe hygienic laws, and apply early for treatment, bubo will not occur in more than 5 per cent. of all cases of chancroids treated.

Buboes are more often single, developing on the side corresponding to the lesion, but may be on the opposite side. When double, they are generally due to the chancroid involving the frænum. Of Sturgis's 71 cases of buboes, 54 were single and 17 double. My records of 36 buboes show that 27 were single and 9 double.

The most marked predisposing causes of bubo are irritation of the chancroid, either by bodily activity or by the use of escharotics that are not sufficiently strong to destroy thoroughly all the diseased tissue, but capable of exciting an inflammatory reaction; lack of cleanliness; and retention of discharge by allowing the ulcer to scab over.

As the terminal vessels of the lymphatics open directly on the ulcerating surface of the lesion, we naturally suppose the exciting cause of bubo to be the absorption of some virulent material. The theory most

[1] Annales de Derm. et Syph., 1895.

[2] Venereal Diseases, 1895, p. 485.

[3] International Encyclopædia of Surgery, vol. ii. p. 436.

[4] Vierteljschr. f. Derm. und Syph., 1888, Heft 2, p. 209.

[5] System of Genito-urinary Surgery, etc., vol. ii. p. 870.

commonly accepted, until recent years, was that this exciting factor was the absorption of micro-organisms from the chancroid, which while traversing the lymphatic vessels produced little disturbance, but when arrested by the glands excited by their irritant action on the tissues an inflammation generally ending in suppuration. The theory just given has been shown to be incorrect by the results of bacteriological research, as repeated microscopical examinations of the contents of buboes have demonstrated the absence of any micro-organisms, and autoinoculation with the pus, antiseptically withdrawn, has invariably failed to produce the typical ulceration. Strauss examined the pus from forty buboes and failed to find any micro-organisms, and autoinoculation with this pus was unsuccessful, while control-experiments of inoculation with the secretion of the chancroid caused the characteristic sore. These results have been verified by Spitschka.

Therefore the evidence leads us to believe that the true exciting cause of bubo is the absorption of poisonous substances, toxins or ptomaïnes, resulting from the action of the germs in the chancroidal lesion, and is not due to the entrance of the micro-organisms themselves into the lymphatics. Whether these chemical substances are the products of a specific microbe or of ordinary pyogenic germs is a question that is still undecided, but it is probably the latter.

Treatment. The treatment of buboes depends upon the stage at which they are seen, and, consequently, is divided into two classes : that of non-suppurating buboes and that of suppurating buboes. But before taking up their treatment in detail, the insertion of the following tables, showing the relative frequency of the two kinds, will be advisable.

These statistics were obtained by correspondence with officers of the U. S. Marine-Hospital Service, and represent transcripts of the records of several stations. They are intended to show the frequency of the two varieties presenting for treatment, and not the number of inflamed lymph-glands of the groin that will eventually suppurate, as pus forms in nearly all buboes that are left alone ; the percentage of those disappearing without suppuration being very small :

Table II.

| | |
|---|---|
| Total number of buboes | 970 |
| Suppurating buboes | 416 |
| Non-suppurating buboes | 554 |
| Percentage of suppurating buboes to total number of buboes | 42.88 |

Table III.—Cases Treated in Dispensary.

| | |
|---|---|
| Total number of buboes | 521 |
| Suppurating buboes | 232 |
| Non-suppurating buboes | 289 |
| Percentage of suppurating buboes to total number of buboes | 44.52 |

TABLE IV.—CASES TREATED IN HOSPITALS.

| | |
|---|---|
| Total number of buboes | 449 |
| Suppurating buboes | 184 |
| Non-suppurating buboes | 265 |
| Percentage of suppurating buboes to total number of buboes | 40.97 |

The following table (No. V.) is taken from Sturgis's article on "Chancroid" in the *International Encyclopædia of Surgery*:

TABLE V.

| | |
|---|---|
| Total number of buboes | 71 |
| Suppurating buboes | 30 |
| Non-suppurating buboes | 41 |
| Percentage of suppurating buboes to total number of buboes | 42.2 |

After this brief digression the treatment of non-suppurating buboes will now be considered. The treatment of this variety may be (1) by external applications; (2) by the hypodermatic injection of medicinal agents into the substance of the gland; (3) by incision; and (4) by excision.

External applications are employed in the first stage as abortive measures, and later, when suppuration is threatened, to hasten the formation of pus. Tincture of iodine painted around the inflamed gland is the remedy most extensively used to abort buboes. My experience with this drug is that it is of no value in the treatment of this disease, and I have yet to see a bubo benefited by its use. This opinion is confirmed by several surgeons to whom I have written; and Martin says that the external application of iodine is valueless. Auspitz and Szadex are of the same opinion regarding its uselessness.

The most important means to employ when a bubo is seen early and it is decided to try abortive measures, are rest in bed, use of belladonna-ointment, and pressure applied by means of a spica on the groin. In a very few cases these measures will cause a disappearance of the inflammatory symptoms. I have long since given up the treatment just described on account of it being unreliable and unsatisfactory, and now treat all buboes seen before suppuration by another method.

*Injection.* Several antiseptic substances, injected into the inflamed gland, have been used as a means of aborting buboes. Dr. M. K. Taylor[1] several years ago called the attention of the profession to his method of treating buboes by the injection of a solution of carbolic acid. He claims that one injection generally succeeds in aborting a bubo; that suppuration is rare; and a cure is effected in eight to ten days. He uses a solution of ten grains to the ounce, and injects twenty to forty minims.

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[1] AMERICAN JOURNAL OF THE MEDICAL SCIENCES, April, 1882.

Harvey[1] also speaks of the efficacy of this treatment, and says that the time of election for the injection is just prior to suppuration. Others have tried the use of carbolic acid, but were disappointed with the results obtained, and at the present time this agent is seldom employed.

A 1 per cent. solution of bichloride of mercury has also been highly lauded as an efficient remedy in this class of cases. Nannino[2] reported twenty-seven buboes successfully treated by injecting this drug. I have treated five cases by this method, in all of which there was intense pain produced by the medication that lasted for hours; in one case there was severe constitutional disturbance, the febrile symptoms lasting six days; and all went on to the formation of an abscess, necessitating an incision. The average duration of treatment in these cases was seventeen days. I soon discontinued the use of it on account of the severe pain it produced.

The injection treatment that I now wish to consider is the use of a 1 per cent. solution of benzoate of mercury, the action of which is far more successful than that of carbolic acid or bichloride of mercury, and is one that yields satisfactory results in the majority of cases.

Dr. Welander,[3] who first called attention to the marked influence of this drug in the treatment of buboes, reports some extraordinary results, and says that in the majority of non-suppurating cases it will cause a subsidence of the inflammatory symptoms in a few days, and that resolution will be prompt. Of 78 cases reported by him, 56 were cured without any suppuration; but in the remaining number some pus formed in the centre of the gland, necessitating a puncture. Spitschka confirms the results of Welander. Brousse and Botherat[4] reported 10 cases treated by this method, 9 of which suppurated.

My experience with the benzoate of mercury has been so satisfactory that I employ it in the treatment of all non-suppurating buboes; and also in those in which the formation of pus is suspected, but distinct fluctuation is absent. In fact, my experience teaches that it acts most beneficially in buboes in which suppuration is threatened.

The injection should be made under the same aseptic conditions as when a surgical operation is contemplated. I generally inject 20 or 30 minims with a hypodermatic syringe, passing the needle well into the substance of the gland, and entering it at one or more points.

The medication causes a burning pain, which usually lasts about two hours, and some constitutional disturbance; fever ranging from 99° to 104°, and continuing for a few days. In some cases there is a rise in temperature only after the first injection, while in others there is an elevation after each use of the drug. The shortest period of fever recorded was one day, the longest six days, and the average time was three days.

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[1] Medical News, January 23, 1886.

[2] Wiener medizinische Presse, No. 47, 1887.

[3] Archiv für Dermat. und Syph., Heft 3, 1891.

[4] Ann. de Dermat. et Syph., April, 1893.

In two or three days after the commencement of treatment the bubo is much diminished in size and resolution is taking place. In all of my cases some pus, generally small in amount, formed in the centre of the inflamed gland, but at the same time resolution was taking place in the periphery. As soon as any suppuration is detected a small puncture is made, all the pus squeezed out, the small abscess-cavity irrigated with peroxide of hydrogen, and an antiseptic dressing applied. In a few days all discharge ceases, the remaining induration rapidly subsides, and the bubo is cured.

The following table of 22 cases of unselected buboes from my own practice will show the time necessary to effect a cure by this plan of treatment:

TABLE VI.—INJECTION OF 1 PER CENT. SOLUTION BENZOATE OF MERCURY IN NON-SUPPURATING BUBOES.

| Case. | Number of injections. | Total amount injected. | Time necessary to effect a cure. | Remarks. |
|---|---|---|---|---|
| 1 | 2 | 40 min. | 9 days. | |
| 2 | 2 | 40 " | 10 " | |
| 3 | 3 | 60 " | 26 " | Very large bubo. |
| 4 | 3 | 70 " | 12 " | |
| 5 | 4 | 100 " | 22 " | |
| 6 | 2 | 60 " | 20 " | |
| 7 | 2 | 50 " | 13 " | |
| 8 | 2 | 60 " | 25 " | |
| 9 | 1 | 30 " | 5 " | About to suppurate. |
| 10 | 1 | 30 " | 15 " | |
| 11 | 2 | 60 " | 13 " | |
| 12 | 1 | 30 " | 7 " | |
| 13 | 2 | 60 " | 10 " | |
| 14 | 2 | 40 " | 10 " | |
| 15 | 2 | 40 " | 10 " | |
| 16 | 1 | 25 " | 8 " | |
| 17 | 3 | 60 " | 24 " | |
| 18 | 2 | 60 " | 14 " | |
| 19 | 2 | 40 " | 13 " | |
| 20 | 3 | 60 " | 13 " | |
| 21 | 2 | 40 " | 13 " | |
| 22 | 2 | 40 " | 14 " | |

| | |
|---|---|
| Total number of cases . . . . . . . . . . | 22 |
| Total number days of treatment . . . . . . | 306 |
| Average time in days necessary to effect a cure . . . | 13.90 |

I consider this treatment far superior in the majority of buboes to excision of the inflamed glands; since the operation is a trivial one, there is no danger of an accident and no need of an anæsthetic; the scar is scarcely noticeable; and the time necessary to effect a cure is much shorter. On the other hand, the excision of a large bubo is not a simple operation; it leaves a large cavity that, in the vast majority of cases, must heal by granulation, weeks being consumed before cicatrization, and finally a large and unsightly scar is left to remind the patient that he was unfortunate in some of his battles with Venus. Again, discarding everything in this comparison except the element of time, and weighing the most favorable statistics I have seen on excision, that of union by first intention in one-half of the cases, still the scales tip in favor of the benzoate treatment.

Dr. Woodward[1] advocates an early incision in non-suppurating buboes. After the skin has been made aseptic he makes an incision, running parallel to the groin, deep into the gland. After the hemorrhage is arrested, the wound is packed with iodoform-gauze and a sublimate dressing applied. He claims that the inflammatory symptoms soon subside, and that the patient is well at the end of one or two weeks. I have been able to collect only four cases treated in this way, the average time of which was twenty-two days.

*Excision.* In recent years excision has become the favorite method of many surgeons for treating non-suppurating buboes, but the results obtained have been so unsatisfactory that several who formerly excised all inflamed glands have abandoned the operation and treat by external application until pus forms, when the bubo is incised and treated as an ordinary abscess.

Excision of all implicated glands means a difficult and somewhat hazardous operation in a dangerous anatomical region. Accidents have happened in the hands of the most skilful operators; the most serious are wounds of the femoral and internal saphenous veins. The hemorrhage is often profuse, and complete enucleation of all of the diseased glands leaves a cavity that seldom heals before considerable time has elapsed.

Dr. Watson believes in thorough excision, and reports 20 unselected cases, in 10 of which he secured union by first intention. His statistics are the most favorable I have seen, and probably few other surgeons have been as successful.

The following table, representing statistics obtained from the records of surgical operations of several U. S. Marine Hospitals, will, I believe, represent the average time necessary to effect a cure by this method:

TABLE VII.

| | |
|---|---|
| Total number of non-suppurating buboes excised | 96 |
| Total number of days of treatment | 3241 |
| Average time in days necessary to effect a cure | 33.76 |

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[1] U. S. Marine-Hospital Report, 1892.

The shortest time was eight days, the longest seventy-eight days. In several there was union by first intention, and the patients were discharged cured in eleven or fourteen days.

Martin says that the time consumed will be from two to eight weeks, depending upon the size of the bubo excised.

*The treatment of suppurating buboes* may be (1) by incision and treating as ordinary abscess; (2) by incision and curettement; (3) by puncture, evacuation of pus, and distention of the cavity with medicinal substances; and (4) by thorough excision of all diseased glands.

The treatment by incision alone has not yet yielded very brilliant results, the average number of days consumed being shown by the table given below:

TABLE VIII.

| | |
|---|---|
| Total number of buboes treated by incision . . . | 41 |
| Total number of days of treatment . . . . . | 1313 |
| Average duration of treatment in days . . . . | 32 |

Incision and curettement have not given much better results than simple incision. It is true, though, that the cases in which curettement is used are generally more severe, and, consequently, the results would make a more favorable showing if it were used in all suppurating buboes.

These statistics of several cases will give an idea of the comparative treatment:

TABLE IX.

| | |
|---|---|
| Total number buboes treated by incision and curettement | 18 |
| Total number of days of treatment . . . . . | 591 |
| Average duration of treatment in days . . . . | 32.8 |

This treatment is advisable in those cases in which the skin has been destroyed and there is left an unhealthy granulating ulcer.

Karl Szadex[1] reported 274 cases of suppurating buboes treated by incision, curetting, and packing with iodoform-gauze. The average duration of treatment was thirty days.

In speaking of the treatment of this class of buboes by incision and distention of the cavity with medicinal substances, I wish to call attention to only one method, that of Scott Helms[2] and Dr. Hayden's modification of it. This treatment is applicable to all freely suppurating buboes, and should be used in preference to any other.

Dr. Scott Helms removed the pus by aspiration, then injected the cavity with a solution of carbolic acid, and after this was thoroughly squeezed out the abscess-cavity was distended with a 10 per cent. iodoform-ointment.

Fontan[3] also described this treatment with iodoform and vaseline, and reported 41 cases. The average time of treatment was six or seven days.

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[1] Journal of Cutaneous and Genito-urinary Diseases, September, 1888.

[2] Chicago Medical Journal and Examiner, September, 1886.

[3] Espieux: Thèses de Montpellier, April, 1889.

Dr. Otis[1] reported 16 buboes treated by this method, and of his cases, 9 were cured in six days, 1 in fourteen, and 1 in twenty-three days. He says that iodol is as good as iodoform, without the objectionable odor.

Dr. Hayden[2] described his treatment as follows: make a small puncture through the skin at the most fluctuating point of the bubo; thoroughly evacuate the pus; irrigate the cavity with peroxide of hydrogen, then with bichloride solution, 1 to 1000; press out all the fluid; distend the cavity with warm vaseline holding in suspension 10 per cent. of iodoform; and apply a cold bichloride dressing to favor congealment.

The patient should be kept quiet for forty-eight hours, and the dressings removed on the third or fourth day; if no pus has formed, another injection of iodoform-ointment is not necessary; but if the suppuration has not entirely ceased, the bubo should be redressed in the original manner. He reported 15 cases, in which the average duration of treatment was twelve days, and in 12 one injection was sufficient.

Dr. Robert Taylor also advocates this treatment, and says the majority of suppurating buboes can be cured by this method in from ten to twenty-one days.

Dr. Hayden's method has given me the most satisfactory results, and I apply this method of treatment to all freely suppurating buboes. My record of 7 cases shows that 5 were cured by one injection, and that the average time of treatment was thirteen and one-half days. The pain and other inflammatory symptoms soon disappear, and the patient quickly recovers with a scar that is insignificant. I cannot too heartily indorse this treatment, and I believe it will yield satisfactory results to all those who may give it a trial. Of course, there are a certain number of cases in which it is not applicable, and in which it will be necessary to use the curette or excise all the diseased glands.

In speaking of the treatment of non-suppurating buboes by excision, I tried to prove that it did not yield satisfactory results, and the same objections to the operation there noted hold equally good when this method is employed in the treatment of suppurating buboes. As mentioned above, there are some few cases in which thorough excision of all diseased tissue will yield the best results; but they are few as compared with the total number.

The following table will show the results of this operation in a number of cases:

TABLE X.

| | |
|---|---|
| Total number of suppurating buboes treated by excision . | 25 |
| Total number of days of treatment . . . . . . | 989 |
| Average duration of treatment in days . . . . . | 39 5 |

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[1] Journal of Cutaneous and Genito-urinary Diseases, May, 1893.

[2] AMERICAN JOURNAL OF THE MEDICAL SCIENCES, November, 1895.

Tables VIII., IX., and X. were compiled from the reports of surgical operations of several marine hospitals.

From the above statistics I am led to conclude:

1. That buboes are probably caused by the absorption of chemical poisons, the result of the action of the micro-organisms in the chancroid, and not to the entrance of the micro-organisms themselves into the lymphatics.

2. That the benzoate of mercury yields such satisfactory results that it should be employed in the treatment of non-suppurating buboes, and excision reserved for those cases in which benzoate has failed.

3. The injection of iodoform-ointment should be used in the treatment of all freely suppurating buboes, since statistics show that it yields much more satisfactory results than the other methods of treatment applicable to this variety.

4. Incision and curettement should be used in a few cases in which the skin has been destroyed and the ulcer presents an unhealthy granulating surface.

5. Excision should be reserved for cases that have not yielded to other treatment, and for those in which there are several foci of suppuration.

# REVIEWS.

A System of Surgery. In two volumes. Edited by Frederick Treves, F.R.C.S. Philadelphia and New York: Lea Bros. & Co., 1896.

Although, in view of the number already on the market, there may not seem much room for other text-books or systems of surgery, we are compelled to welcome this last production of British surgeons as worthy of a place among the best examples of modern surgical literature. It has been written by twenty-five of the best known men in the United Kingdom, and edited by a surgeon whose work has long since shown him to be as competent in this as in other fields of professional labor. The result is a clear, concise, and thorough presentation of the existing condition of surgical science, a very careful reading revealing but few defects in the nature of omission, and showing, on the other hand, with rare exceptions, careful though conservative study and criticism of the latest theories and methods.

Volume I. opens with an article by Dr. Woodhead on surgical bacteriology. His classification of the bacterial surgical fevers is, as we have found, better for practical work in teaching than any of the more elaborate ones. He places all such fevers under one or the other of three headings:

"1. Sapræmia or true toxæmia, in which the products only of bacteria find their way into the system. Under this heading two sets of conditions may be included: (*a*) In the case of the tetanus bacillus the manufactory may go on entirely outside the body, and the products of the organism, finding their way along with earth into a bruised wound, may set up a distinct tetanic condition before the micro-organism has had time to develop any further products within the body; (*b*) in other cases of tetanus the bacillus is introduced locally into devitalized tissues; here a fresh quantity of poison is developed by the multiplying organisms at the seat of injury, and is absorbed into the body, the bacilli remaining strictly localized. In diphtheria there is a similar toxic condition arising out of the development of poisonous products which are carried into the system, although here again the bacilli are strictly localized to the seat of original invasion.

"2. In the case of true septicæmia not only the bacterial products, but the bacteria themselves, find their way into the distant parts of the body; of this there are many examples among the lower animals; such diseases as anthrax and acute hemorrhagic septicæmia may be taken as examples in the human subject. In the latter disease it is evident that the specific bacteria or their products are acting directly on the walls of the bloodvessels.

"3. In order to create a further class for cases in which there are distinct clinical appearances, the old term pyæmia may be retained to denominate those cases in which we have the presence of abscesses, the result of septic thrombi or emboli, the active agents in these thrombi and emboli being bacteria which have usually found their way into the body by way of some accidental or surgical wound."

His teaching as to the causation of the surgical infections is equally sound and worthy of careful reading. Racial, individual, and tissue predisposition is considered most important, as "the whole idea of protective inoculation and acquired immunity rests on the fact that these varying susceptibilities to various diseases are present in different species and under different conditions."

If every hurried worker in surgery would bear in mind the essential truth of the following paragraph, it would have a beneficial effect on surgical mortality: "It cannot be too strongly insisted upon that everything which lowers the general condition of the patient predisposes to infective surgical diseases—overcrowding, vitiated atmosphere, want of cleanliness, bad hygienic conditions, including bad and insufficient food, and exposures to extremes of heat and cold, want of sleep, imperfect or irregular evacuation of the excretions, excitement, and emotion—an influence all important to the surgeon, now that many of these factors have actually been found by experiments on animals to predispose to certain forms of disease." These are facts known to the profession in the main since the days of Hippocrates, but constantly ignored in everyday practice.

Mr. Cheyne, in his article on Suppuration, says very truly that "the ideal treatment of chronic abscess is to dissect out the abscess as one would dissect out a cyst, without opening it. If this can be done, a clean-cut wound is left, which is not infected with tubercle bacilli or other bacteria, and we have healing by first intention. This method of treating chronic abscesses may be carried out in a very considerable number of cases; for example, in the subcutaneous abscesses of children (gomme scrofuleuse of the French) cure is at once effected by dissecting them out, while months may elapse before healing is obtained by the other plans of treatment. Hence, whenever the abscess is not too large (and, after all, a long skin incision is not a matter of the slightest consequence, except in exposed parts of the body), and wherever the connections of the abscess are not such as to render it anatomically impossible to remove it, this is the treatment which should be adopted."

In the article on Gangrene he says that as a result of antisepsis "the rules as regard amputation in senile gangrene are completely altered. In fact, in my opinion, one should, in the great majority of cases of senile gangrene, recommend early amputation. By operating at an early period the patient's strength is not worn out by continued pain and loss of sleep, and he is in a very much better condition to survive the operation than if it be delayed to a later period. The only difficulty is that one does not know how far the process will extend; but, as a rule, this can be judged of by ascertaining the point at which the pulsation in the main vessels ceases, and if one cannot ascertain this, then the best place for amputation in most cases is the knee-joint."

As an example of the practical impossibility of making any text-book or system the exponent of the very latest developments in surgery, it may be noted that the article by Surgeon-Major Duncan on Military Surgery, while containing full directions for determining the position of a bullet or other missile, makes no mention of the Röntgen rays, which we venture to say will be used in every military hospital during the next great war.

In the chapter on the influence on operations of constitutional conditions Mr. Treves embodies a great deal of sound advice and none better than the following:

"It may be safely said that the results of operations and injuries are more powerfully influenced by diseases of the kidneys than by a corresponding disease of any other organ. An operation upon the subject of advanced Bright's disease or of surgical kidney is a desperate matter. A patient may look fairly healthy, may appear well nourished, may be temperate and living a most regular life, and the operation may be but a trifling one; yet the complication of albuminuria renders the surgical procedure most serious and hazardous. Many an elderly man has died almost suddenly from the effects of rough catheterization, and it has been found after death that he was the subject of an unsuspected pyelitis. Quite slight operations of an urgency—such as that for the relief of Dupuytren's contraction of the palmar fascia—have placed the subjects of Bright's disease in great danger of death. In no case should an operation on an adult be undertaken without a preliminary examination of the urine."

Mr. Hewitt's conclusions as to the choice of anæsthetics will find practically no acceptance in America, where it is thought, and correctly, that clinical experience has demonstrated the soundness of the view that neither chloroform nor the A.-C.-E. mixture should be employed with anything like the frequency recommended by him.

A sentence or two from Mr. Treves's article on Tuberculosis should be written over the doors of many hospitals. "The principal elements in the treatment are plenty of air, plenty of sunshine, and plenty of good food." . . . . "Sunshine and dry air are deadly to the bacillus, and light and oxygen are of more value than all drugs."

A full appreciation of the essential truth of these facts would save thousands of lives now lost through well-meaning but futile endeavors to attain the same ends by the use of medicine.

Mr. Stanley Boyd evades any expression of opinion as to the rule which should guide surgeons in the operative treatment of recent fractures of the patella, but very properly places Mr. Barker's operation at the head of those methods which avoid a large, open wound.

Mr. Dean, in an interesting and exhaustive article on Diseases of the Head, thus summarizes the phenomena associated with brain-tumors: "There are three classical symptoms which are almost certain to be present some time during the course of the disease; they are headache, vomiting, and optic neuritis. In addition there may be (*a*) symptoms of overaction, such as Jacksonian epilepsy and subjective sensations or auræ; (*b*) symptoms of want of action, such as motor paresis or paralysis of various kinds. It is very important to bear in mind the progressive character of the symptoms; there is a slow but steady march from the earliest sign to the fatal termination."

In the same article he describes his own operation for the intracranial complications of otitis media, exploration having, he thinks, often resulted negatively because the abscess was cerebellar, or, again, because the cerebellum, being explored, the pus was above the tentorium. He adds: "If we admit that in the majority of cases it is impossible to diagnose in which region the abscess is situated, the decision not to make a complete search for the pus cannot be justified by any argument. I have pointed out that in every case of cerebral abscess following otitis media the surgeon can, with one skin flap and with one opening in the skull, explore both the temporo-sphenoidal lobe and the cerebellum. It should be laid down as a rule that in all these cases the surgeon must be prepared, before commencing the operation, to search, if necessary, both above and below the tentorium. The bone should be perforated by a trephine or other suitable instrument at a spot one and one-quarter inch behind and a quarter of an inch above the centre of the external auditory meatus. By this procedure a part of the lateral sinus and the dura mater just above it are exposed. After slightly enlarging the hole upward with a pair of sharp-cutting gouge-forceps the dura mater can be incised and an exploration of the temporo-sphenoidal lobe satisfactorily carried out. If the pus be not found, the opening can be enlarged to a slight extent below it. By incising the dura mater at this spot the cerebellum can be easily exposed within a few minutes of exploring the temporo-sphenoidal lobe."

In the treatment of complete prolapse of the rectum Professor Ball still prefers the actual cautery so applied as to make vertical linear eschars, and he quotes from Van Buren the description of that method which, as a rule, gives such excellent results. He advises Whitehead's operation in severe cases of internal piles, but says that ligation is the method employed most frequently, and that the clamp and cautery possess no advantages over these more exact and scientific methods.

Mr. Cheyne reviews the evidence as to the parasitic origin of cancer, and concludes: "At the present time, while one must admit the possibility that cancer is a parasitic disease, and that these bodies described by Ruffer and others are the parasites of the disease, there is no real evidence in support of that view."

Mr. Henry Morris, in his article on the Urethra, includes among the indications for internal urethrotomy " a disposition to urethral fever and the presence of vesical and renal complications," adding that these " are not reasons against but in favor of the operation; because fever may be prevented or checked, a free passage provided, and the kidneys and bladder relieved from overdistention by the operation."

This is very unsound teaching, and if followed would probably result in a large mortality-rate. Patients with renal disease and with tight stricture do not die, as a rule, from the immediate effects of back pressure or overdistention. On the contrary, if there have been such pressure and distention to any marked extent, great care must be taken not to relieve them suddenly even by simple catheterization. These conditions do indicate, however, external perineal urethrotomy as the operation of choice; and clinical experience, reinforced by statistics, amply demonstrates the wisdom of selecting this operation in the class of cases under consideration.

Mr. Morris does not appear to be familiar with the position which the operation of castration for hypertrophy of the prostate now holds, the published records amply justifying rather positive assertions as to its value, and certainly entitling it to more than a dozen lines (some of which contain an error of statement) in an article purporting to guide the surgeon in his management of these trying cases.

Mr. Treves's article on peritonitis and the affections of the abdomen takes him over ground which he has already illuminated by his work and his research. There are many valuable lessons contained in these pages; but in view of the existing tendency both in and out of the profession to exaggerate the frequency and the gravity of appendix disease and to subject unnecessarily large numbers of persons to operation, none of these teachings seems better worth quoting than the following: "The great majority of the cases of perityphlitis (appendicitis) call for no operative treatment. In the ultra-acute cases it is well that the abdomen be opened at once in the cæcal region, and the case considered and dealt with as one of perforated peritonitis. Such cases are very uncommon. When the evidences of abscess are present, an incision should be made into the collection as soon as possible." . . . "The abscess should be opened and drained. It should not be scraped, and it is of no avail to make search for the appendix. To excise an appendix by a plastic operation when it is situated at the bottom of a foul abscess is not in conformity with surgical principles. A gangrenous appendix, if met with, may be snipped off, and if a perforated appendix actually presents itself it may be ligatured and cut away. As a matter of fact, after an abscess has once formed, very little more is heard of the appendix. These abscesses are apt to degenerate into fistulæ and sometimes into fecal fistulæ. They exhibit, however, a strong tendency to close spontaneously in time. An incision in perityphlitis is very seldom called for before the fifth day. The wound made is not infrequently followed by a ventral hernia."

Want of space prevents us from making further excerpts. Enough have been made to illustrate in a general way the merits and demerits of the work. The former largely predominate, and the book is sure of a place among the more important recent contributions to surgical literature. J. W. W.

GRUNDRISS EINER KLINISCHEN PATHOLOGIE DES BLUTES FÜR AERZTE UND STUDIRENDE. Von DR. R. VON LIMBECK, Privatdocenten für innere Medicin, ordinirendem Aerzte des K. K. Krankenhaus "Rudolfstiftung" in Wien. Mit einem Beitrage: DIE GERINNUNG DES BLUTES, von DR. ERNST FREUND, Vorstand des chem. Laboratoriums des K. K. Krankenhaus "Rudolfstiftung" in Wien.

OUTLINE OF A CLINICAL PATHOLOGY OF THE BLOOD. By DR. RUDOLPH VON LIMBECK, of Vienna. With a chapter on the COAGULATION OF THE BLOOD, by ERNST FREUND. Second edition, with thirty-seven illustrations in the text and two colored plates. Jena: Gustav Fischer, 1896.

THE enlargement and revision of this useful work are not merely nominal. With almost twice the number of pages as the former edition, space has also been gained in this one by the omission of some long case-histories. The various sections are arranged in a more natural order and the clinical part forms a section in itself. All through the book the author's industry is shown by changes and additions. The methods for examining the corpuscles are more fully described. The chemical and physiological properties of the blood are treated at great length, the chapter forming a valuable guide to the subject in all its bearings. The chapter on the Coagulation of the Blood, by Dr. Ernst Freund, is well done. The section on Morphology of the Blood-corpuscles is also a complete *résumé* of the subject. In the chapter on Blood Parasites, the malarial organisms and the spirillum of relapsing fever are fully described, filaria and distomum being too briefly mentioned to be of much value to either the student or investigator.

When we come to the clinical section we find that the author's application of the term "outline" is appropriate, and this is to be regretted, as a fuller discussion of the clinical problems from one so well-fitted would have been most welcome. Von Limbeck gives a new classification of anæmias, in which chlorosis, simple primary anæmia, leukæmia, and pseudo-leukæmia are included under Primary Anæmias. Concerning pernicious anæmia, the author now abandons the increased hæmoglobin-value as a criterion, believing the relative excess is met with in nearly all severe anæmias. He says, however, that the evidences of rapid and progressive dissolution of red corpuscles, as shown by the hydrobilinuria and icterus seem to separate some cases of anæmia, including genuine cases of Biermer's, from others, like chlorosis. We should like to have an expression regarding the author's experience with the leucocytes in this condition. He does not mention the relative increase of the small mononuclear cells which so many observers have noticed in these cases.

Leukæmia is considered much more fully. The evidence regarding the lessening importance of the neutrophile myelocyte as a pathognomonic sign is duly set forth, but we miss a distinct statement regarding the eosinophile myelocyte in this as well as in the description of the eosinophile cell in the earlier chapter. This is certainly unfortunate, as differences in the form of the eosinophile cells in health and disease have not been investigated as much as they deserve. Acute leukæmia, pseudo-leukæmia, and the secondary anæmias receive appropriate consideration.

An important feature of Von Limbeck's work is the extensive bibliography at the end of each chapter. The enormous accumulation of hæmatological literature, however, is rendered still more evident by the numerous omissions in these lists. American and English authors are, for the most part, conspicuous by their absence.

The illustrations are not such as we have been accustomed to by other publications of Mr. Gustav Fischer. The cuts are worn and indistinct; many were poor originally. The copies of figures after Laveran contain details that we have never seen in any of Laveran's publications, and, although hardly more than diagrams, may, nevertheless, be misleading. Figure 30, credited to Laveran, is really from an early article by Golgi, and the plates from which it and the following figure were taken might have been given with advantage in place of the description on page 290. The colored plates are also unsatisfactory. We may mention especially Fig. 2, intended to show Neusser's granules, but by no means characteristic; Fig. 4, in which the so-called normoblasts are three times as large as normal red corpuscles and larger than megaloblasts in Fig. 3; Fig. 5, in which the so-called "Cornil-Ranvier-Mullersche Markzellen" are of unusual appearance and show only basophile granulations. Ranvier's name is given here as well as in the text, though we are not aware that he had anything to do with the cells in question. These and other shortcomings we have mentioned are of trifling importance in comparison with the vast amount of valuable material in the book, and, like the faults of the first edition, will no doubt soon be corrected in another one. The work is indispensable to all who have to examine the blood for diagnostic or scientific purposes, as well as to those who would quickly learn the present condition of our knowledge of the blood and its diseases.

G. D.

# PROGRESS

OF

# MEDICAL SCIENCE.

## THERAPEUTICS.

UNDER THE CHARGE OF

REYNOLD W. WILCOX, M.D., LL.D.,
PROFESSOR OF MEDICINE AND THERAPEUTICS AT THE NEW YORK POST-GRADUATE MEDICAL SCHOOL AND HOSPITAL; VISITING PHYSICIAN TO ST. MARK'S HOSPITAL.

### OVARIAN THERAPY.

M. F. JAYLE states that this consists of the administration of (1) the ovary in its natural condition; (2) ovarian powder obtained by desiccation or a glycerin extract. The second in two-grain doses a quarter of an hour before the noonday meal is preferred. The indications are against (1) the accidents provoked by castration; (2) certain ovarian lesions; (3) the normal menopause; and (4) Basedow's disease, osteomalacia, etc. He concludes that (1) the ovary appears to be the source of an internal secretion which is useful to the economy of the woman. (2) This medication appears to be without danger. (3) It is followed by permanent success in the troubles provoked by the artificial menopause. (4) It appears that it can be used to advantage in the different symptoms due to an ovarian lesion (amenorrhœa, dysmenorrhœa, adiposis, chlorosis). (5) It seems to be useful in certain cases against the symptoms of the natural menopause.—*La Presse Médicale*, 1896, No. 71, p. 437.

### THE EFFECTS OF THE ADMINISTRATION OF THE PITUITARY GLAND.

MM. MAIRET and BOSC have used the gland of the ox, either triturated or macerated. In animals (rabbits), excepting disturbances evidently due to local infection produced by the subcutaneous injection, very slight effects were obtained—a transient elevation of temperature, most marked two hours after the injection. Injected into the veins it produces disturbances similar to those obtained after injection of blood, namely, death from coagulation. If treated by sodium chloride or by heat it produces results similar to those of blood-serum when similarly treated, but is distinguished only by a more marked myosis. If given by the mouth, beside a slight elevation of temperature, there are noticed gastro-intestinal disturbances and a temporary albuminuria. Evidently this substance possesses only a slight degree of toxicity. With dogs nothing of importance is noticed; subcutaneous injections give rise to some emaciation and slight and temporary elevation of temperature. With healthy men substantially the same results were reached. To ascertain its effect upon epilepsy twenty-one cases were studied; of these, six are carefully reported. From these the following conclusions are presented: (1) The injection and ingestion of the pituitary gland do not diminish the attacks of epilepsy; if it has any action, it is generally to increase them. (2) The ingestion of this substance produces, quite constantly, attacks of delirium. These attacks, which come on three or four days after its administration, resemble in certain cases the agitation peculiar to epileptics, if indeed they may not be simple coincidences. In other cases they present especial characteristics which have not been before noticed.—*Archives de Physiologie*, 1896, No. 3, p. 600.

### THE ACTION OF THYROID PREPARATIONS UPON PATIENTS SUFFERING FROM GOITRE.

DRS. ARTHUR ISSAI, BERNHARD VAS, and GÉZA GARA have made use of the tablets in three very carefully observed cases, and report their conclusions as follows: (1) The goitre has diminished in size. (2) The body-weight is diminished; the most marked result being obtained after long-continued use, and is in proportion to the amount of the gland-substance taken. (3) The amount of urine is increased. (4) The nitrogenous excretion in the urine is increased. (5) The balance of nitrogenous excretion is a negative one, *i.e.*, more is excreted than is taken in. (6) The uric-acid excretion is increased, especially during the first days of the treatment. (7) The excretion of sodium chloride and of phosphoric acid is increased. From these observations it would seem that the fat-layer very probably shares in the diminution of weight.—*Deutsche medicinische Wochenschrift*, 1896, No. 28, S. 439.

### ACCIDENTS CHARGEABLE TO SERUM-THERAPY.

DR. G. H. ROGER states that the appearance of an abscess is not due to the method, but to want of care, insufficient disinfection of skin or instruments, or to change in the serum. The only exception to this statement is when antistreptococcal serum obtained from animals immunized by means of living cultures is used, and the use of this serum should be abandoned. Exanthemata are not due to the same causes as are abscesses. They are not to be avoided, for they are caused by normal as well as by the various antitoxic serums. They appear generally three or four days after the injection, and even to the tenth or twentieth day. The age of the subject nor the amount of the serum used has no connection with their appearance; all depends upon the individual predisposition. Other manifestations—urticaria, erythemata, and coincidently fever and articular symptoms, which may seem to be severe and sometimes really alarming symptoms, as albuminuria—hemorrhages and gastro-intestinal disturbances may be observed. Some serums are prone to give rise to disturbances; others are harmless. It would seem that these manifestations are less frequent if the serum is removed from the animal while fasting. The arthropathies do not go on to suppuration (Broca's case is an exception). The fever is often slight and temporary; it is observed after the injection of normal serum. Serum has a diuretic effect according to some writers; others have noticed a diminution of urine. It, however, increases the excretion of urea and the phosphates and diminishes that of the chlorides. As for albuminuria, the opinions are varied. The view of the author seems to be that it may give rise to this condition; generally it is but temporary. Besides hemorrhagic nephritis and cutaneous hemorrhage, notably purpura, it may produce epistaxis and uterine hemorrhage. In one instance of pregnancy it produced no disturbance. As to modification of the blood, it is difficult to say whether these hemorrhages are due to vasomotor changes or to those of the blood itself. It evidently produces a leucocytosis. Other accidents have been noted—vomiting, profuse, dysenteric, and sanguinolent diarrhœas, glandular swellings, swelling of the spleen, and cardiac disturbances. In spite of this long list of accidents there is no reason for restriction of the use of these serums, but our efforts should tend toward improvements in their manufacture, so that useless and harmful substances may be eliminated.—*Gazette hebdomadaire de Médecine et de Chirurgie*, 1896, No. 64, p. 757.

### ARTIFICIAL DIPHTHERIA ANTITOXIN.

DR. G. SMIRNOW states that the preparation of the toxins in bouillon is easier, more convenient, and cheaper than in serum, and in addition equally good results are obtained. This substance is obtained by electrolysis of the diphtheria toxins, and its use upon the twelve guinea-pigs previously infected with diphtheria shows that in each instance recovery followed.—*Berliner klinische Wochenschrift*, 1896, No. 27, S. 597.

### KITASATO'S ANTICHOLERA SERUM.

DR. A. NAKAGAWA reports the results of its use in one hundred and ninety-three cases. The former rate of mortality (among Japanese) has been about 70 per cent. In these cases the percentage was lowered about 20. The subsidiary results are similar to those of diphtheria antitoxin: (1) Urticuria, very common. (2) Arthralgia, observed in only eighteen cases. (3) Myalgia in six cases. The difference in prognosis, according to the time which had elapsed before coming under observation, is shown as follows: Less than eight hours, no deaths; eight to twelve, 22.2; twelve to twenty-four, 32.1; twenty-four to forty-eight, 39.7; forty-eight to seventy-two, 38.7; over seventy-two, 31.1 per cent. mortality. Three cases were observed in children under two years of age.—*British Medical Journal*, 1896, No. 1855, p. 121.

### THE RESULTS OF HAFFKINE'S ANTICHOLERA INOCULATIONS.

MR. ARTHUR POWELL has summarized all of the observations in India hitherto published and while they are not sufficiently numerous to have definite conclusions, they hold forth strong encouragement for continuing the experiments on an extended scale. He concludes: (1) That the inoculations even in the larger doses hitherto used do not confer a complete immunity. (2) That a considerable degree of immunity seems to be conferred when the doses injected are sufficiently large to produce marked febrile reaction; and (3) that smaller doses confer little or short-lived protection.—*The Lancet*, 1896, No. 3803, p. 169.

### ACUTE HEMORRHAGIC SEPTICÆMIA TREATED BY ANTISTREPTOCOCCUS SERUM.

MESSRS. CHARLES A. BALLANCE and FRANCIS C. ABBOTT report a single case. The patient, a physician, pricked his thumb in making a *post-mortem* examination. Cellulitis and lymphangitis followed, and within twenty-four hours the whole body was covered with a scarlet septic erythema. The face was puffy and the eyes suffused. There was severe pain in the arm, and in the intervals of pain he was listless and drowsy. Later the rash became hemorrhagic in places, the drowsiness became more marked, the respiration was rapid, vomiting occurred several times, and there was slight bleeding from the nose. Less than a drachm of antistreptococcal serum was injected and repeated every four hours. Strychnine and digitalis were subsequently given, and upon the third day of its administration the dose of the antitoxin was doubled. Convalescence was established, although the rash did not disappear until the eighth day of the disease. The following results are apparently obtained: (1) The mind became clear, notwithstanding the high fever. (2) The frontal headache ceased. (3) The tongue began to clear, and became moist from the edge until it was clean, moist, and of a peculiar pink color over its entire surface. (4) The pulse became slower and of better quality. (5) The respiration was slower and never jerky afterward. (6) The skin, which was dry and feverish, became moist, and sweating occurred. (7) The wounds (incisions, to relieve tension) healed without suppuration; and the threatened inflammation of the great synovial sac under the anterior annular ligament subsided.—*British Medical Journal*, 1896, No. 1853, p. 2.

### THE EXCEPTIONAL EFFECTS OF THE BROMIDES.

DR. S. WEIR MITCHELL notes, among the effects, irritability, increase of irritability or melancholy at menstruation, bad temper, suicidal or homicidal tendencies, temporary delusions in trauma affecting the brain, and exceptionally melancholia may rise to the grade of danger and occasion suicidal impulses. In one instance when irritability followed the use of bromides, excitability could be as easily and more quickly awakened by the smallest amount of alcoholic stimulus or any large use of tobacco. It is also known that the bromides are competent to give rise to suicidal and homicidal impulses.—*University Medical Magazine*, 1896, No. 9, p. 661.

### POISONING BY PYROGALLIC ACID.

M. DALCHÉ reports that a young man of twenty-three years took two hundred and twenty-five grains of this drug dissolved in absinthe and water. In the evening he suffered from black vomit and burning secretions in the throat. The second day there was slight jaundice, the lips were purple, the urine was dark, almost black, and contained methæmoglobin and oxyhæmoglobin. The liver and spleen were enlarged. Two days after he became delirious and died in coma. On necropsy the alimentary canal, lungs, and brain were found to be healthy. The liver and spleen were enlarged. The kidneys were colored dark brown, the tubes of the cortex and the glomerular cavities were filled with small refractive spheres, which were also found in the capillaries and veins. These spheres, of the size of a red blood-corpuscle, gave the micro-chemical reaction of iron. The epithelium of the convoluted tubes seemed to be unchanged and did not contain any pigment. It may be concluded that in this instance there was a profound change in the blood, with destruction of the corpuscles, a lesion entirely different from that of paroxysmal hæmoglobinuria.—*Journal des Praticiens*, 1896, No. 22, p. 349.

### Antitetanic Serum.

M. **Haushalter** states that one has his choice between the liquid serum, which should be employed in large doses; the dry, which is more active, and the antitoxin of Tizzoni. The statistics do not show in the mortality a sufficient lowering for forming an opinion, since the death-rate varies considerably according to the intensity of the disease. The general impression obtained from his paper is that the serum does not influence the course or the result of the disease when it is of a severe or rapid character, and that when cure has resulted it is apparently independent of the action of the serum. The preventive action is better established, but there are great difficulties in its application, for no one knows what wounds and what injuries will be followed by tetanus.—*Journal des Praticiens*, 1896, No. 33, p. 528.

### The Indications for Serum-therapy in Syphilis.

Dr. **Rochon** calls attention to the fact that the treatment of syphilis does not consist only in gorging the patient with mercury or the iodides, but we should attend to the organism itself. It is proved that the organism can battle with an infection by producing a substance which will arrest or at least modify the evolution of a virulent agent—that is, an antitoxin. Mercury and the iodides, either by increasing the resistance of the organism or by diminishng the virulence of the infectious agent, can give victory to the subject attacked; but if the subject is incapable of reaction, then it is necessary to interpose another force. In case the organism is incapable, and when hygiene and rest remain insufficient, then sero-therapy finds its true and indeed its cnly indication. Three observations are reported, the serum being taken from a syphilitic of from six to eight years' duration, the last symptoms dating back three to six months. The conclusion is that the serum, when used for severe manifestations, is of doubtful power or even inert. Its use is chiefly then in the tertiary stage of the disease.—*La Médecine moderne*, 1896, No. 70, p. 553.

### Vaccine Produced by Passing the Virus of Smallpox through the Cow and Calf.

Dr. **W. J. Simpson** reports his experiments, which show an intimate relationship between smallpox and vaccine. In these experiments, some of which were carried out in Aberdeen and others in India, successes were obtained from inoculations of lambs, cow, heifer, healthy fowl, sheep, and calves, from which active vaccine was obtained.—*Indian Medical Gazette*, 1896, No. 6, p. 205.

### The Treatment of Neuralgia by Injections of Osmic Acid.

Dr. Erwin Franck reviews the literature from 1882, recommending osmic acid, 1; distilled water, 6; glycerin, 4; (Schapiro) to be kept in a closed bottle. Of this one-sixth of a grain of the drug is to be used, although in one instance the dose was four times this amount. Three cases are reported —right facial neuralgia, sciatica, and tabes in ataxic stage. In the first cure was obtained; in the second disappearance of the pain for eight weeks, recurrence which the treatment failed to relieve; in the third relief of the hyperæsthesia and neuralgia of the ulnar nerve, cessation of the pain during time of observation (one month). The needle should be inserted perpendicularly and deep into the muscles or to the bone as near as is possible to the most painful point, the overflow on the skin being prevented by a bit of cotton. When injections are made into the face, a smaller quantity should be used in order to avoid induration, which may be of a dark color.—*Fortschritte der Medicin*, 1896, No. 16, S. 609.

### Panbotano.

Dr. Gabriel Pouchet states that this drug, of Mexican origin, contains (1) an appreciable quantity of saponin. (2) An alkaloid, at present undetermined, of which a hydrochloride has been prepared. (3) A colored, and (4) a colorless substance. (5) A certain proportion of tannin. The alkaline resinate (colored resin combined with an alkali) is an energetic irritant, and in intraperitoneal injection (guinea-pigs) caused death; the symptoms are depressed temperature, abolition of reflexes, slowed heart and respiration. A solution of the alkaloid acts similarly, the slowing being more marked. In man the drug was found equally irritating, due, in great part, at least to the colored resin. These experiments are insufficient to interpret the action of the drug, which appears to be efficacious in malarial disease, but they serve to demonstrate that there is to be found in the drug several active principles whose pharmacodynamic study presents much interest.—*Les nouveaux Remèdes*, 1896, No. 15, p. 441.

### Pellotin.

Dr. A. Heffter has carried out laboratory experiments upon this drug which possesses the chemical formula $C_{13}H_{19}NO_3$. This occurs in crystalline tablets of a bitter taste, with difficulty soluble in water, but readily in alcohol, ether, and chloroform. With acids can be made crystalline salts, the hydrochloride being chosen for therapeutic purposes. With frogs, after injection, slight narcosis follows in from ten to fifteen minutes. The reflexes are somewhat diminished and strong irritations are necessary to obtain repose. After twenty to thirty minutes there comes a distinct increase of reflex excitability, then follows spasms, recalling those of strychnine-tetanus. This period of increased excitability of the reflexes may continue with undiminished intensity for several days. If large doses are now administered, this condition sooner or later passes into one of complete paralysis. The irritability of motor nerves is destroyed only after long periods of spasms. The explanation of these symptoms lies in the increased excitability of the spinal cord. It is excreted by the kidneys, at least the alkaloid can be found there in small quantities. For healthy men the dose, as a hypnotic, is about a grain. About two hours after taking it by the mouth there come on a feeling of weariness, weight of the limbs and eyelids, and a disinclination to bodily and mental exertion. The pulse-rate is diminished for about an hour. Headache and nausea have been observed. The poisonous symptoms are those of a narcotic through paralysis of the brain, and later tetanic symptoms which have their origin in the increased irritability of the spinal cord. This places the drug, from the pharmacological standpoint, in the morphine group.—*Therapeutische Monatshefte*, 1896, Heft 6, S. 327.

## A Case of Cephalic Tetanus.

Dr. J. M. Van Cott reports that of a four-year-old boy, who presented muscular twitching of the face, the mouth being drawn slightly to the left side, general irritability of temper, and attacks of screaming with no apparent cause. Three days later there was paralysis of muscles of the right side of the face, the mouth drawn to the opposite side, the forehead of the left side wrinkled, ptosis of right eyelid, and complaint was made of pains in the back and general stiffness of the arms and legs. Two days later there appeared spasm of the muscles of deglutition, mastication, and those of the neck, the head was drawn backward and the jaws firmly locked. This attack lasted for ten minutes, when the muscles of the neck and back relaxed, but the jaws remained closed. Profuse flow of saliva appeared later. During the following two weeks all the symptoms increased in severity, opisthotonos being constantly present, and death took place about one month from the date of the first record, during a severe convulsion. The only lesion noted was a white pimple at the base of the nose, which, according to his mother, had been present for ten days. The treatment consisted of absolute quiet, warm baths, chloral, and potassium bromide in large doses by the mouth and by the rectum. He was fed through a tube upon peptonized foods, stimulants, and milk.—*Brooklyn Medical Journal*, 1896, No. 7, p. 401.

[See The American Journal of the Medical Sciences, 1896, vol. cxi. p. 590.—R. W. W.].

## Eucaine.

Dr. Görl has used this drug in dermatological and urinary practice because of the expense of cocaine, notably in cystoscopic work. The best results were obtained with a one-half of 1 per cent. solution, which has been used after the manner of Schleich's infiltration method. The first injection is somewhat more painful than Schleich's solution; with the rest there was noticed no difference. Phimosis and buboes can be operated upon with absolute freedom from pain, and after infiltration of the base large condylomata acuminata can be removed by the galvano-cautery loop. Furuncles can be incised without the least pain. An advantage is found in the fact that the drug can be heated with spring-water without decomposition, and thus sterile solutions can be obtained *ex tempore* without the addition of a disinfectant. Since this drug is an irritant, it should not be used in the urethra when more frequent than daily anæsthesia must be obtained. The hyperæmia resulting from the use of this drug is a contraindication to its use in cystoscopic investigations, in which a tumor or lesion with tendency to hemorrhage is suspected.—*Therapeutische Monatshefte*, 1896, Heft 7, S. 378.

## ARSENICAL PARALYSIS.

M. COMBY reports that a girl of seven years, suffering from a severe chorea, received about four grains of arsenous acid in eleven days. The choreic movements permanently ceased upon the fifth day, but on the sixth there was some vomiting. Two months later she returned, presenting a paraplegia which had existed for six days. That is to say, she had remained entirely well for forty-six days after the last dose of arsenic. Upon her reappearance there was absolute loss of power of the lower limbs, abolition of the patellar reflexes, and of the plantar sensibility to tickling, but there was preservation of the sensibility to pain. There was no muscular atrophy nor appreciable trophic disturbances, the intelligence was good, there was no pain, and the appetite was preserved. She was treated by electricity, strychnine, and sulphur baths. In spite of this the paralysis progressed and involved the trunk and upper extremities. Control over the bladder and bowels was lost. After ten days this incontinence ceased, and movement returned to the upper and later the lower limbs. Five weeks later the child was cured, she walked alone, stood upon one foot, the tendon-reflexes returned, and the general condition continued to be excellent. There was no doubt that the dose of arsenic was too large, and it should not be pushed beyond the limits of tolerance, but stopped when nausea, vomiting, and gastric disturbances present themselves.—*Journal des Praticiens*, 1896, No. 27, p. 428.

## THE TREATMENT OF CONSTIPATION.

DR T. LAUDER BRUNTON regards this symptom as the reaction of a healthy organism to unfavorable surroundings, viz., too soft food, too little water, or too little exercise. For the first, one may advise bread, either made of the whole grain or with more or less bran; vegetables in abundance, either cooked, as spinach, cabbage, broccoli, Brussels-sprouts, cauliflower, carrots, turnips, parsnips, and the like, or raw, as tomatoes or celery. Fruits are of advantage—melons, apples, oranges, and figs. When stewed prunes are inefficient in keeping the bowels open, some senna leaves may be tied in a bag and placed in the receptacle in which the prunes are to be stewed. This plan has often been successful when the ordinarily stewed prunes have failed. Sugars in themselves are useful laxatives. A favorite addition to the breakfast is marmalade which contains vegetable salts, sugar, and also the hard skin of the orange cut into small pieces, which are rather indigestible and give a mechanical stimulus to the bowel. Water, insufficient in quantity or abnormal in quality, is a cause of dryness of the bowel which results in constipation, which may be lessened by the taking of a tumblerful of hot or even of cold water on rising in the morning and on going to bed. For waters from a chalky soil, some of the bottled waters, soda, potash, or aërated water, should be substituted. The habit of evacuating the bowels at a certain time should be formed; at night if the patient suffers from hemorrhoids. Exercise is of advantage, massage, rubbing the bowels in the direction taken by the hands of a watch, are also useful. In delicate women, especially those suffering from ovarian or uterine trouble, exercise may be harmful. In defecation where the floor of the perineum is lax it may be necessary to press the fecal mass forward in something of the same way in which the accoucheur turns forward the child's head. Open-air defecation causes a stretching of the floor of the pelvis and affords support to the fecal mass as it is forced backward by the action of the abdominal muscles. This can be imperfectly imitated in the closet by the patient leaning forward to an acute angle. In some cases hydropathic treatment is useful, wet compresses to the abdomen two or three times daily and sitz baths, cold in summer and with the chill taken off in winter.—*The Lancet*, 1896, No. 3796, p. 1483.

## MEDICINE.

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### SYRINGOMYELIA FOLLOWING TRAUMATISM.

EULENBURG reports a case, one of three similar ones he has had occasion to examine. A tinsmith, aged forty years, accidentally burned his right thumb over a gas-flame in 1886. There was great pain, and a bleb formed, but the man wrapped up the thumb and continued to work. Five days later a bit of zinc-plate, wet with hydrochloric acid, got under the dressing and directly on the wound. On the following days the patient had repeated attacks of nausea, with temporary loss of consciousness, followed by severe and extensive phlegmons, requiring deep incisions and threatening the loss of the thumb. There was no diminution of sensibility. No foreign body could be found then, nor could one be found at first in a skiagraph. The latter seemed to reveal disease of the phalanges and metacarpal bones of the injured hand, the bones giving fainter pictures than those of a normal hand. Later, however, a small foreign body could apparently be seen at some distance from the old wound, perhaps a fragment of the original piece of metal. After the inflammation subsided the arm became weaker. The patient was unable to work, but as no objective disease could be found was considered a malingerer. Later, atrophy of the right, later still of the left arm, became manifest, gradually involving the shoulders. Considerably later—about a year ago—dissociated disturbances of sensibility appeared, and the diagnosis of syringomyelia was made. Narrowing of the pupils and the approximation of the lids are now present on the right side, and there is scoliosis of the cervico-dorsal part of the spinal column.

The original article contains a discussion of possible objections to the causal connection advanced, and also of the possibility of zinc-poisoning, not necessary to detail here.—*Deutsche med. Wochenschrift*, 1896, No. 29.

## PARALYTIC CHOREA.

GUMPERTZ (*Berliner klin. Wochenschrift*, 1896, No. 31) reports the following interesting case: A girl, now eight years old, had articular rheumatism at three years, soon followed by chorea. In the course of the latter speech was lost, and in a few weeks complete loss of voluntary motion followed. Recovery ensued, but a year later a similar set of symptoms developed, also ending in recovery. The next year the child escaped a recidive, but a year later chorea minor appeared. At first motility and strength were normal, but in a short time paralysis developed. There were lively choreic spasms of the facial muscles, with tossing of the arms and legs. At the same time all voluntary and co-ordinated movements became impossible, except those of the eye. The tongue could be protruded, with fibrillary tremors. With evident efforts the patient could pronounce simple words in an explosive manner and with excessive grimaces. All the voluntary muscles were perfectly lax. The sphincters were not affected. The knee-jerk was absent. Electric excitability remained; sensation was not impaired; the skin-reflexes normal. There was a well-compensated mitral stenosis. The persistence of the chorea after paralysis and the tendency to recidive distinguished Gumpertz's case from most cases previously reported. The differential diagnosis is given briefly, with a reference to other cases.

## DIABETES MELLITUS AND CIRRHOSIS OF THE LIVER.

PUSINELLI has made an interesting study of a case in which these conditions occurred. The patient's father had a history of cataract and thirst, so suggesting diabetes, but reached the age of eighty-five years. There seemed to be nothing in the patient's history to account for his own disease. This began in 1887, with mild, temporary jaundice, ascribed at the time to overwork. There was no glycosuria. In 1888 thirst became noticeable, and examination showed 1½ to 2 per cent. of sugar in the urine. This disappeared after treatment at Carlsbad, but soon returned. Up to 1892 the annual visit to Carlsbad was followed by cessation of diabetes for some months. After 1892 the sugar did not disappear under Carlsbad treatment, but the symptoms of diabetes were not marked. After a mental shock in 1893, followed by catching cold, mild jaundice and swelling of the abdomen developed. Soon after this ascites, œdema of the feet, and enlargement of the liver and spleen were discovered. Paracentesis of the abdomen was followed by rapid reaccumulation of the fluid. The operation had to be repeated twice again within three weeks, twenty-eight litres of fluid being removed in all. After a fourth tapping with a large trocar the fluid oozed away for a week, and the ascites never appeared again. By the end of six months after the shock the patient was able to resume his business. The jaundice gradually disappeared, the enlargement of the liver and spleen diminished, but did not entirely cease.

Before the ascites began the urine contained sugar to the amount of 2 to 5 per cent., with a trace of albumin. When ascites was at its height both sugar and albumin disappeared and did not reappear until two weeks after the last tapping, and when the amount of urine again exceeded the amount of fluid ingested. This change in the condition of the urine was quite independent of treatment or diet. Similar occurrences have been reported by others, but no satisfactory explanation has been given. Treatment during the ascites consisted in the administration of potassium bitartrate in half-ounce doses with the occasional administration of Carlsbad salt.

The patient died after about two years and a half of fair health. The glycosuria diminished, anasarca and albuminuria developed. Autopsy showed widespread atheroma of the arteries; marked sclerotic changes in the liver, especially in the portal areas; fresh tubercles on the peritoneum; ascites; enlarged spleen; diabetes-kidneys; recent tubercles on the pleuræ, and old and recent tuberculous changes in the lungs.

The author considers the liver disease in such cases as one *sui generis*. It is characterized by marked increase in the size of the liver and spleen, but little tendency to contraction on the part of the liver, and accompanied by pigmentation of the skin.—*Berliner klin. Wochenschrift*, 1896, No. 33.

## GUMMA OF THE ŒSOPHAGUS.

Berger (*Deutsche med. Wochenschrift*, 1896, No. 32) treated a patient with this unusual cause of stenosis of the cardia. A man, fifty-five years old, without definite history of syphilis, but with a history of severe headaches, an eruption without itching, and, on coming under observation, enlarged inguinal glands, had vomiting several times a day, usually after meals. This had lasted a year. There was a loss of weight amounting to thirty kilograms. The patient would not permit the exploration of the œsophagus, but the suspicion of stenosis of the cardia which was raised by the history was confirmed by the usual symptoms of complete obstruction, which appeared a month later. At that time even the smallest sound could not be passed beyond the cardia, and there was a slight obstruction in the upper part of the œsophagus. At first it was supposed the patient had carcinoma of the cardia, with a metastasis above. Later on, however, the long course of the disease and the absence of cachexia raised again the thought of syphilis. Potassium iodide was accordingly prescribed. Improvement soon began, and in about a month it was possible to pass a sound into the stomach. The obstruction higher up had also disappeared. As the patient continued to improve, the slight possibility of an ulcerating carcinoma became altogether improbable, and the author's diagnosis of gumma will no doubt be accepted. That such obstructions are due to gummata rather than gummatous scars is the general opinion of others who have investigated the subject.

## The Pyogenetic Action of the Typhoid Bacillus and Bacillus Coli.

A. Schmidt reports two interesting cases (*Deutsche med. Wochenschrift*, 1896, No. 23). In the first, a man of thirty-four years, symptoms of subphrenic abscess developed ten days after the beginning of convalescence from typhoid fever. By the end of three weeks the signs were quite marked. Operation revealed an abscess containing three litres of thin, light-brown pus, having a stale but not fecal odor. Recovery was rapid. Bacteriological examination of the pus gave a pure culture of typhoid bacilli. The course of infection was not clear. From the absence of fecal odor in the pus the author concludes that the bacilli probably came from an abscess in the spleen or in a mesenteric gland, rather than from the intestine directly. The physical characteristics of the pus in this case resembled those in the case of post-typhoid abscess reported by A. Fränkel.

In the other case, a student with colitis, empyema developed. The strongly fetid pus gave a pure culture of colon-bacilli. The infection of the pleura no doubt followed the route through the retroperitoneal connective tissue, a process not uncommon in the course of abdominal inflammation, some interesting examples of which have been published by Curschmann.

## Prodromal and Secondary Exanthemata.

Bernhard (*Münchener med. Wochenschrift*, 1896, No. 34) calls attention to the importance of the prodromal and secondary rashes in various diseases. The prodromal rashes are most frequent in measles and rubella, but occur also in diphtheria, pneumonia, scarlatina, varicella, and pertussis. They have no peculiar character in the various diseases, polymorphous rashes being the rule. Diffuse erythema or macules of various sizes and various degrees of redness occur. Usually the rash does not last more than three days. The face is not affected. Sometimes the rash fades if the patient is kept exposed for some time. Conjunctivitis is not present, but photophobia may be in the early stages of measles. Pharyngitis is frequent. There is little or no fever, but apathy, anorexia, indisposition, or malaise may be observed.

The secondary rashes, according to the author, occur in three forms. The first appears from the tenth to the twenty-first day in those who have had rhinitis, rhagades on the lips, aphthous ulcers, necrotic anginas, exanthemata or pneumonia. There are red spots the size of lentils on the body and extremities. The face is but slightly affected. The macules become larger, confluent, pale in the centres, with elevation of the margin. The temperature at such times tends to fall. The diazo-reaction may be present. Bernhard thinks this rash is like that described by Raudnitz as *erythema exudativum multiforme septicum*, which Martineau saw follow vaccination.

The second form, which occurs in the same kind of cases, has often been observed in secondary streptococcus infections. About the end of the second or beginning of the third week lentil-sized macules occur over the joints, especially the knees, and spread centripetally. An epidemic occurrence may be observed, as Hutinel claimed, so that isolation should be practised.

The third form of the rash occurs as a scarlatiniform redness. It appears earlier than the others, and, in contrast to them, may be accompanied by a rise of temperature. Streptococci are concerned in some but not all of these cases, in which Bernhard thinks the primary virus may sometimes cause the secondary rash. In one of his cases diphtheria-bacilli were present.

## TETANY IN CHILDHOOD.

HAUSER (*Berliner klin. Wochenschrift*, 1896, No. 35), as the result of an extensive investigation, gives the following conclusions regarding tetany in childhood: 1. There is a genuine tetany affecting children, which in part of the cases is precisely like tetany of adults. Its most striking symptom is the contracture of the extremities. With this one finds one or all of the symptoms of the so-called tetanic triad. The etiology of the infantile tetany is not yet demonstrated. Healthy children are rarely affected. Rickets seem to be an important predisposing cause. The exciting cause in many cases is a gastro-intestinal disturbance. This is proved by the frequent association of the two conditions, and by the success of treatment directed to the acute dyspepsia. Infantile tetany is a dangerous and often fatal disease. At present the only causal treatment possible is that indicated in cases with digestive disturbances. In these one should empty the stomach and bowels by lavage and cathartics, remove toxins already present, and endeavor to prevent their further production through the decomposition of albuminoids by keeping up amylaceous diet for a time. In other cases a similar diet with narcotics (bromides, chloral) should be used.

2. Besides the tetany with typical contractures there is a latent tetany in childhood. The diagnosis of this form is based on the demonstration of increased irritability of the nerves to the galvanic current, which does not occur to the same extent in any other disease. Trousseau's symptom is of equal importance, if present. A well-marked Chvostek's symptom may aid in the diagnosis, but is not diagnostic in the absence of the others.

3. Cases of latent tetany frequently show severe spasm of the glottis as their most marked symptom. All cases of spasm of the glottis, especially if severe, must therefore be examined with reference to tetany, especially by the aid of Erb's and Trousseau's symptoms.

4. The larger majority of cases of spasm of the glottis have no etiological relation with tetany. There is, however, a close relationship between rickets and laryngospasm.

5. The spasm of the glottis has no demonstrated causal relationship with craniotabes.

## VARIETIES OF THE TYPHOID ERUPTION AND THEIR SIGNIFICANCE.

SINGER (*Wiener klin. Wochenschrift*, 1896, Nos. 15 and 16) has examined the skin lesions which sometimes appear in typhoid fever in the form of papules, each of which has a small pustule on its summit. He has examined bacteriologically blood obtained by incising these small follicular abscesses, and has obtained cultures of typhoid bacilli four times in five cases. One of these was a doubtful case, in which the diagnosis was made by the culture. In sections of the papules the bacilli could not be found. Singer is disposed to look on the typhoid eruption as a direct infective process in the skin, and not as a reflex.

### Acute General Infection with Friedlaender's Bacillus in a Case of Otitis Media and Empyema of the Mastoid.

Brunner (*München. med. Wochenschrift*, 1896, Nos. 13 and 14) reports the following: A man of fifty-five years had empyema of the antrum after acute otitis media. The mastoid was trephined and the pus removed. Symptoms of meningitis followed, with evidences of general infection, including high fever and pus in the urine. Death followed two weeks after the operation. There was extensive meningitis; discolored clots in the transverse and longitudinal sinuses; erosion of the temporal bone communicating with the trephine-opening; enlarged and soft spleen; advanced cirrhosis of the liver; small abscesses with hemorrhagic margins in both kidneys. Examination of the pus removed at the operation as well as that obtained at the autopsy, blood from various organs, and urine showed a pure culture of Friedländer's bacillus. The origin of the fatal disease in an otitis media caused by bacilli from the nasopharynx seems clear. The author believes that among pyæmias due to Friedländer's bacillus the meningeal forms occupies an important place. In both this and the pneumococcus infection the source of the bacteria is such as to readily infect the meninges.

## SURGERY.

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### Two Cases of Pulmonary Abscess Treated by Operation.

The London *Lancet* (1896, No. 8, vol. ii.) contains an account of two cases of pulmonary abscess under the care of Dr. F. J. Smith and Mr. Frederick Treves. Both cases presented the same fundamental symptom—excessive fetor of the breath.

The operation consisted in raising a triangular-shaped flap over the diseased area, and resecting portions of the ribs exposed. In the first case the parietal and visceral pleuræ were adherent at the point exposed. An incision was made directly in the lung, and very offensive pus evacuated. In the second case the pleuræ were not adherent and the margin of the wound was plugged with iodoform-gauze in such a way that a circular patch only of the lung beneath was exposed. A trocar introduced into the lung thus exposed failed to draw any pus. The lung was then incised, and more than an inch of healthy parenchyma was passed through before the abscess-cavity, which was the size of a cricket-ball, was reached. The bleeding was comparatively insignificant.

In both cases the cavity was scraped, dried, and stuffed with iodoform-gauze, the end being brought out of an incision made in the centre of the skin flap, which was sutured in place. The original tampon was not disturbed for four days. Both cases made good recoveries, although the first one required a second opening.

## THE RELATION BETWEEN MALIGNANT LYMPHOMA AND TUBERCULOSIS.

DIETRICH comes to the following conclusions (*Beiträge zur klin. Chirurgie*, Bd. xvi. Heft 2) at the end of his interesting and careful researches, which were carried out in Bruns's clinic:

1. There are combinations of malignant lymphomas with tuberculosis of the glands themselves or of other organs, although no etiological relation between the two is supposed to exist.
2. There are not a few cases of multiple lymphoma in which the differential diagnosis between tuberculosis and benign lymphoma can scarcely be made clinically, and in the absence of softening and breaking down pass under the mask of malignant lymphomata. In fact, they cannot be differentiated even on the dissecting-table.
3. Necrosis and softening do not justify the deduction that the process is tuberculous, since these changes have been observed in certain cases of malignant lymphoma.
4. The diagnosis of a malignant lymphoma must be determined always by excision of a portion of the growth and histological examination.
5. Of probable diagnostic value are the eosinophile cells, which in malignant lymphomata are numerous, while in tuberculosis they are few in number.

## RUPTURE OF THE URETHRA TREATED BY EXTERNAL URETHROTOMY AND SUTURE.

CABOT reports five cases of rupture of the urethra treated by external urethrotomy and suture in the *Boston Medical and Surgical Journal*, 1896, vol. cxxxv. No. 3. The report is of unusual interest because three of the cases were examined at periods varying from four and a half to two and a half years after the operation. The summary of the results and the technique of the operation are described as follows:

In all of these cases the immediate result was good. In three of them the opportunity was given for an examination some years after any dilating instruments had been used. In Cases I. and V. no stricture was found, and instruments as large or larger than any used after the operation slipped past the point of rupture with perfect ease.

In Case IV., while no interference with urination was noticed, a narrowing of the urethra was found. This narrow point was, however, not a hard cicatricial stricture, but was so soft and yielding that without the least exercise of force it was rapidly dilated to a good size.

These results would certainly encourage a continuation of attempts to promote immediate union of the urethra when divided by violence.

The operation is not a difficult one. A median incision opens the blood-cavity about the urethra. After the clots have been turned out, a sound passed down the urethra quickly shows us the anterior end. If the urethra is not fully divided across, the rent is then easily seen and rapidly repaired. When the division has been complete, the posterior end may not be so easily found; but in a fresh rupture the profuse bleeding which occurs from the bulb of the urethra, instead of obscuring our search, serves as a guide to that which we are seeking. If, then, the bleeding-point in the posterior part of the wound is seized with forceps and pulled forward, the collapsed and retracted end of the urethra will be brought to view. In a case of longer standing, and when the bleeding has stopped, the search may be more difficult, in which event firm pressure should be made above the pubes to force the escape of urine to serve as a guide.

In all of these cases the suture was made with interrupted catgut stitches, which were all placed before any of them were tied. Care was taken to include only the cavernous and muscular tissue in the stitches, and not to encroach on the mucous membrane. In every case, upon tying the stitches, the hemorrhage immediately stopped.

CONCLUSIONS: 1. In cases of ruptured urethra immediate perineal section with suture of the urethra should be practised.

2. By this procedure not only do we greatly lessen the danger of urinary infiltration and abscess, but we also, in a large proportion of cases, may hope to prevent the formation of close intractable strictures.

3. In an early operation the search for the posterior end of the urethra is much easier than it is later. The hemorrhage from the branches of the artery of the bulb serves as a guide to that end of the canal.

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## A PISTOL-BULLET IMBEDDED IN THE BRAIN PHOTOGRAPHED BY THE ROENTGEN RAYS.

In a contribution read before the Académie des Sciences (*Medical Press and Circular*, N. S., vol. lxii. No. 2984) MM. BRISSAUD and LONDE reported the case of a man who had received a pistol-shot in the middle of the left frontal eminence. Consciousness was apparently not lost, but the patient was unable to move or to speak for a few hours, when he became able to answer in monosyllables. When examined eighteen hours after the injury there was complete left hemiplegia and loss of sensibility from the finger-tips to the bend of the elbow. No attempt was made to find the ball. There was fever, which steadily declined, for nine days. For fifteen days the urine and feces were discharged involuntarily.

At a later period the chief symptoms were occasional outbursts of laughter, spasmodic left hemiplegia of the limbs and face without implication of the superior facial, common motor oculi, and masticators. A sciagraph showed the bullet in the posterior region at the level of the second temporal convolution. This corresponded with the course of the ball as determined from the symptoms, it having perforated the frontal lobe from left to right. As the ball was located in the temporal region the hemiplegia was not due to its presence, but had resulted from the division of nerve-fibres in its path, and was therefore not of cortical, but of capsular origin. The practical result of the use of the Roentgen rays was that, with the evidence obtained, a surgical operation was and would have been useless.

## THE RADICAL CURE OF HERNIA BY OPERATION.

After briefly reporting thirty-six operations for the radical cure of hernia, MACARTNEY (*The Lancet*, London, 1896, No. 8, vol. ii.) calls attention to two important points in technique. The first is "not to close the wound until all hemorrhage has ceased, because the laxity of the tissues is such as to encourage reactionary bleeding when the wound is closed up and the patient comfortably warm in bed;" and the other is that he always opens the sac of the hernia.

Regarding the former, those who have had the annoyance of consecutive bleeding after one of these operations, with distention of the wound, and have witnessed the delay in healing and the uncertainty of the final result in consequence, can testify to the necessity for the exercise of unusual care to avoid this unfortunate accident.

The latter is a precaution that will in rare instances lead to the detection of either omentum or intestine in what appeared to be an empty sac, as is illustrated by two of Dr. Macartney's cases.

## CONCERNING THE SO-CALLED HYPERTROPHY OF THE PROSTATE GLAND AND THE ANATOMICAL CAUSE OF THE SENILE INSUFFICIENCY OF THE BLADDER.

In a preliminary report on this subject before the Eighth Polish Surgical Congress in Krakow, DR. STANISLAW CIECHANOWSKI presented the following conclusions (*Centralb. f. Chir.*, 1896, No. 32):

I. 1. The arterio-sclerosis must not be considered as the cause of the changes in the kidneys, bladder, and prostate, as has been claimed by the Guyon school.

2. The anatomical explanation of the insufficiency of the bladder, in all cases in which it is connected clinically with the so-called prostatism, is a quantitative change in the relation of the bladder-muscles to the connective tissue.

3. This quantitative change seems to be a regular phenomenon in advanced years, and becomes more marked the older the patient grows. It reaches a higher degree when in addition to the condition mentioned there is a mechanical obstacle to the escape of the urine. The symptoms are most marked when besides these two conditions chronic inflammation of the bladder sets in. As a rule, all these factors play a part. Exceptionally only one, *e. g* the senile atrophy of the bladder-muscles, which can be demonstrated anatomically, may give rise to complaints of urinary troubles. The influence of these damaging conditions can be in some measure compensated for by the ability of the bladder-muscles to hypertrophy. The muscular hypertrophy

of the bladder develops whenever there is a mechanical obstruction which interferes with its ready evacuation. An exception to this rule is rare.

The final effect of these factors depends upon their sum. In coming to a conclusion in any case they must all be taken into consideration.

II. The so-called hypertrophy of the prostate seems to have very little in common with homoplastic new formations. On the contrary, the hypertrophy in the condition known as prostatism must be looked upon as a primary factor and almost always depends upon chronic inflammatory changes which take place either in the glandular part or in the stroma, or in most cases in both.

The result of these inflammatory changes, which by no means terminate always in the hypertrophy of the entire organ, and which resemble greatly chronic post-gonorrhœal inflammation of the prostate, seems to depend on their extent, but above all upon their localization.

The more central the inflammatory changes of the stroma, and the nearer the periphery the changes occur in the glands, the greater the probability that the end-result will be hypertrophy.

The opposite of the above-mentioned changes may have no effect on the size of the prostate, but it is not impossible that prostatic atrophy would occur in certain cases.

Generally speaking, the author asserts that in the majority of aged individuals whom he has examined there was in the prostate evidence of a very prolonged inflammation demonstrable anatomically, which, although not always, yet in some predisposed conditions caused an enlargement of the glands, improperly termed hypertrophy.

The so-called prostatic hypertrophy seems, as a rule, to depend on these chronic inflammatory changes, even if it does not represent the only termination.

## The Sterilization of Syringes by Boiling.

In a communication to the *Centralblatt für Chirurgie*, 1896, No. 27, Hofmeister claims to have solved the question of the sterilization of syringes. Although much time and thought have been expended in the effort to devise a means by which syringes for surgical and bacteriological purposes could be easily and quickly rendered sterile, no satisfactory method has been proposed heretofore. Of all the new patterns of syringes that have been recommended none has had sufficient merit to displace the old form with the leather packing, and yet it has not been possible to make the latter aseptic.

The observation by the author of the fact that catgut could be boiled without injury after first hardening in formalin solution led him to apply the same process to leather. It was found that common leather which was allowed to stand for twenty-four hours in a 2 to 4 per cent. solution of formalin could be boiled in water without losing its softness, durability, and elasticity.

Leather so prepared has been boiled for ten hours without damaging it. A slight deepening of the color was the only change to be observed. On the contrary, leather not so treated after boiling becomes in a short time so soft as to be useless, and can be torn easily. After drying it makes a mass as hard as stone, which can be crushed into powder.

The experiments brought out the fact that the formalin leather which was boiled one hour each day for several days and dried each time retained its natural and useful qualities better if subjected to the formalin solution before each boiling than if macerated once only.

These experiments resulted in the adoption of the following process for sterilizing syringes:

1. Only such syringes as consist of glass, metal, and leather are suitable. The metal parts should not be fastened by putty, but should be screwed to the cylinder.
2. The piston with the leather packing is taken out and placed in ether or benzine to remove the oil.
3. It is then transferred for twenty-four to forty-eight hours in a 2 to 4 per cent. formalin solution.
4. After rinsing thoroughly the syringe may be put together and is ready to be boiled.
5. When ready for boiling the air is to be driven out of the cylinder by filling with water. Glass syringes should be put in cold water and gradually heated.
6. From time to time the piston with the leather packing is to be placed again in the formalin solution. After removing the oil the leather should be examined to see that it has not shrunken. If the piston fits closely, then it will not shrink in the subsequent steps of the process. After two months' trial the method has proved itself to be practical.

## The Employment of Argonin in the Treatment of Gonorrhœa.

Bender (*Jour. de Méd. de Paris,* May 10, 1896) gives the following as the result of his observations in the treatment of gonorrhœa by this drug:

Argonin dissolves in ten times its weight of water; four fluidrachms of this solution contain an amount of silver equivalent to fifteen grains of the nitrate. This solution does not form a precipitate in the presence of chloride of sodium or the albuminoids.

Jadossohn's treatment of gonorrhœa consists in the injection, three or four times a day, of about three fluidrachms of this solution, gradually increasing the strength up to 7.5 per cent. The solution should be retained in the urethra, if possible, for ten minutes. The injections are not absolutely painless and have no astringent effect. Fifty-four cases treated in this manner recovered in a maximum of six weeks. In 30 acute cases the gonococci disappeared in one week in 12 cases, in two weeks in 14 cases, in three weeks and less in 4 cases. In 24 chronic cases the gonoccocci disappeared at the end of one week in 7 cases at the end of two weeks in 10 cases, and in three weeks in 7 cases. After the gonococci disappeared ichthyol was used. Failure occurred in two cases only.

# DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

UNDER THE CHARGE OF

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## Medicinal Catarrh.

Mr. George Cohen, of Edinburgh, reports (*The Lancet*, July 13, 1895) that he has been enabled in some cases to control the coryza following the administration of potassium iodide by giving five-minim doses of belladonna tincture for each ten grains of the salt.

## A Case of Diffuse Papillomatous Degeneration of the Nasal Mucous Membrane.

This case is reported and illustrated with a photo-micrograph by G. Hunter Mackenzie, of Edinburgh (*The Lancet*, 1896, No. 3807). A man, thirty years of age, complained of partial nasal obstruction and stuffiness. Nine years previously both nostrils had been subjected to electro-cauterization for thickening of the mucous membrane. The membrane in both passages was studded throughout by numerous sessile growths, varying in size from a pin's head to almost a grain of rice. Several of the larger ones were removed with the cold snare, but the greater number required detachment by the nasal curette. Four months later there was no recurrence. The microscopic appearance described by Dr. R. F. C. Leith shows the undoubted papillomatous character of the growths.

## Adenoid Vegetations.

Dr. Arthur J. Gillette, of St. Paul, Minn., reports (*New York Medical Journal*, August 1, 1896, No. 922) three cases of torticollis due to adenoid vegetations and chronic hypertrophy of the nostrils, relieved by operations upon these tissues made by Dr. J. E. Schadle, Instructor in Clinical Laryngology of the State University of Minnesota.

[This is an entirely new field of observation, and deserves to be followed up to discover whether such cases are exceptional or otherwise.]

## A Case of Aneurism by Anastomosis involving the Vessels of the Hard Palate.

This case is reported by Mr. A. Marmaduke Sheild (*The Lancet*, 1896, No. 3807). It occurred in a retired officer, fifty-seven years of age, who had suffered from liver affections, but not from malaria. On January 15th he lost about a half-pint of arterial blood by hemorrhage into the mouth, an ounce on the 16th, and there was further bleeding on the 17th and 18th. An ulcer, the size of a three-penny-piece, was noted on the left side of the hard palate, close to the alveolus of the second molar tooth. Temporary arrest of hemorrhage by pressure and ferric chloride was always followed by recurrence. A pulsatile swelling the size of a filbert occupied the tissues at the base of the alveolar process, with one large, pulsating vessel posteriorly which could be compressed without altering the pulsation of the tumor. A portion of the maxilla was removed so as to insure complete extirpation of the growth, which proved to be an aneurism by anastomosis. There was some difficulty in restraining hemorrhage after the operation, but within a week the result was thoroughly satisfactory.

Some comments upon this infrequent result followed the report of the case.

### Tuberculosis of the Lymphoid Tissue in the Pharynx.

At the last meeting of the American Laryngological Association Dr. Jonathan Wright, of Brooklyn, N. Y., read an interesting paper (*New York Medical Journal*, September 16, 1896, No. 930) upon the tuberculous infection of the lymphoid tissue in the pharnyx. He repeated the experiments of Dieulafoy without finding any bacilli in the lymphoid tissue, and without developing tubercle in guinea-pigs in whose peritoneal cavities and subcutaneous tissue some of the substance had been placed. In addition to this he refers to a single case, seen in consultation, in which symptoms of tuberculosis of the rhinopharynx were noted within a week after operation for adenoids, the patient having been exposed to infection by attendance on a sister dying of pulmonary tuberculosis; but he thinks the patient must have had this tuberculous focus in her nasopharynx at the time of the operation.

A beautiful colored section of the specimen from this case accompanies the article.

[In connection with some of the recent observations concerning tuberculosis of the tonsils, it is well for the student to be reminded that some fifty years ago Dr. Horace Green, of New York, prominently called attention to the frequent association of tubercle of the tonsil with tubercle of the apex of the lung on the same side.]

### Varicella of the Larynx.

M Marfan and J. Halle (*Medical News*, September 5, 1896, No. 10; *Revue mens. des malad. de l'enfance*, January, 1896) report two cases of varicella of the larynx:

1. A boy, three years of age, was suddenly seized with great dyspnœa and paroxysms of suffocation. Tracheotomy was performed on account of cyanosis. After injections of antitoxin (under suspicion that the case might be diphtheria) a typical eruption appeared on various portions of the body. Breathing soon became normal, and recovery followed.

2. A child, aged nine months, with typical eruption over the greater surface of the body, and with marked stridor and difficulty of breathing. Antitoxin was injected, notwithstanding the negative evidence of diphtheria. Broncho-pneumonia and copious diarrhœa followed, and death was not long delayed. The autopsy revealed a circular, shallow ulceration about the size

of a pea on the posterior part of the right vocal band, probably a ruptured vesicle.

[It is stated that statistics of laryngeal varicella furnish but one recovery; nevertheless, the writer of this compilation remembers several cases of recovery in which his help had been solicited in an endemic in Philadelphia more than twenty-five years ago.

It is also stated that stenosis of the larynx in varicella may at times be confounded with diphtheria, and that a bacteriological examination will serve to distinguish the two. This would be in the presence of diphtheria and the absence of the eruption on the surface].

### Primary Erysipelas of the Pharynx.

Dr. William Porter, of St. Louis, reports (*New York Medical Journal*, August 15, 1896, No. 924) his third case, which occurred in a young adult. The larynx was not involved, but the erysipelas inflammation of the pharynx and rhinopharynx was well marked. The right Eustachian tube became involved, and, finally, the corresponding middle ear. The symptoms yielded to vigorous treatment with iron and at times pilocarpine, with free insufflations of stearate of zinc and applications of ergot externally, although there was the usual tendency to relapse.

### Acute Primitive Pseudo-membranous Rhino-laryngo Bronchitis.

Dr. J. Glover presents (*Annales des maladies de l'Oreille du Larynx*, 1896, No. 5) a contribution to the study of this form of disease, accompanied with illustrations of the parts during life and after death.

The case occurred in a woman, sixty-seven years of age, the subject of a chronic bronchitis with subacute exacerbations every spring. On February 13, 1896, she was taken with slight fever with little chills, loss of appetite, followed on the next day by a coryza soon accompanied with bronchitis. Her temperature became elevated every evening, the cough became very intense and persistent, with very liquid and abundant whitish expectoration. On the 17th hoarseness began in the morning, increasing toward evening to complete aphonia, fever became more marked and permanent, and the respiration difficult. The throat did not present any exudation. On the 18th of February she was admitted to the Hospital Lariboisiere very much excited by increasing impediment of respiration. The vestibule of the larynx was filled with frothy mucus, and as this was coughed out appeared to be covered with thick exudation, disseminated in points and in large plaques on the laryngeal face of the epiglottis, on the ventricular bands, and on both vocal bands. The laryngeal isthmus presented the aspect of a grayish infundibulum of very irregular surface, formed by the croupous layer of pseudomembrane. Islets of exudation, easily removable, existed on the base of the tongue posteriorly, and on the sides of the lingual tonsil; the subjacent mucous membrane bled in the neighborhood of each attachment. The aspect of the buccal pharynx presented the appearance of a very extended exudation, such as appears in an undoubted diphtheria.

Rhinoscopy, both anterior and posterior, gave no appreciable results. The dyspnœa was a little peculiar. Slight suction at the suprasternal fossa, and movements of the wings of the nose; laborious respiration with active participation of the thoracic muscles; feeble depression at the epigastric region synchronous with the commencement of the inspiration; inspiratory laryngeal stridor existing for a portion of the phase of inspiration, the expiration being made almost without noise.

The evident stenosis of the glottis pointed to two suppositions: mechanical obstruction of the isthmus of the glottis by membrane, and paralysis of the dilator muscles.

Despite persistent difficulty in respiration, tracheotomy was not performed because the multiplicity of obstacles to the respiration seemed to implicate the lungs more than the larynx.

Although the repeated bacteriological examination disclosed nothing but staphylococci, 20 c.c. of antidiphtheritic serum were injected at noon. An unsuccessful attempt was made to produce prompt dilatation of the glottis with forceps. At 4 P.M. temperature became elevated, the patient very much agitated, sweat was profuse, urine diminished, showing albumin. Nevertheless, the respiration was more quiet In the evening reduction of the temperature to 38.8° C.; the patient slept, and respiration seemed quiet. The patient died at midnight.

The post-mortem appearances are very carefully reported and illustrated in detail. To be brief, the pseudo-membranes extended from the posterior nasal outlets clear down to the third divisions of the bronchi. The only bacteriological element was the staphylococci.

## INTUBATION IN THE ADULT, WITH SPECIAL REFERENCE TO ACUTE STENOSIS OF THE LARYNX.

At the last meeting of the American Larnygological Association, DR. W. E. CASSELBERRY (*New York Medical Journal*, 1896, No. 927) read a paper upon this subject, illustrated by a number of cases in his own practice for details of which we must refer the reader to the published record. His conclusions are that intubation may be substituted for tracheotomy in acute stenosis due to laryngeal diphtheria, but that in acute œdema of the larynx the indications are not so clear. Should the jaws be "set," or should pharyngeal swellings be present, intubation is absolutely contraindicated and fruitless; efforts thereat can only tend to intensify the exhaustion and suffering of the patient. In urgent dyspnœa from arthritis deformans and in traumatic œdema from scald, corrosion, or fracture, intubation might be preferable in suitable cases.

Laryngismus stridulus might constitute another indication. So, also, œdema of the larynx secondary to chronic syphilis or tuberculosis occurring as an acute exacerbation, provoking sudden and urgent dyspnœa.

In the discussion Dr. E. Fletcher Ingals, of Chicago, mentioned a number of cases in his own practice, his experience having been unfavorable in acute stenosis of the larynx in adults. He thinks that time should not be wasted on intubation, as tracheotomy is almost always necessary subsequently to save life; and in this view Dr. Ingals was supported by Dr. W. K. Simpson, of New York.

Dr. A. W. De Roaldes, of New Orleans, called attention to a class of cases in which intubation has done good; that is, in fracture of the larynx, as it holds the fragments in proper apposition.

# OPHTHALMOLOGY.

UNDER THE CHARGE OF

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## Transplantation of Skin-grafts for the Cure of Ectropion.

D. Argyll-Robertson (Edinburgh) describes (*The Practitioner*, August, 1896) the method he has pursued for the relief of ectropion. To insure success the following conditions must be obtained: 1. Immobility of the eyelids; 2. The formation of a graft that will accurately fit the raw surface to be covered; 3. The removal of all fat and cellular tissue from the graft; 4. The retention of the graft in apposition to the raw surface with the least possible injury to or interference with the transplanted skin; 5. The use of suitable antiseptic applications.

1. To secure immobility simple stitching of the lids together (without paring the edges) keeps them fixed for a period sufficiently long to enable intimate union of the graft with the raw surface to occur.

2. To fit accurately the raw surface he has employed the device of cutting out of a piece of paper an exact pattern of it, placing this pattern upon the skin at the part whence the graft is to be taken, and then making the necessary incisions parallel to the edge of the pattern, an allowance of about a fifth or a sixth of the width of the flap being made all around for shrinkage.

3. There is no necessity for great care in dissecting off the skin-flap to avoid the removal of fat or cellular tissue, as any that remains attached to the graft can easily be cut off subsequently with scissors curved on the flat.

4. To maintain the apposition of the graft, stitches at its margins were tried, but proved provocative of mischief. Robertson, therefore, has recourse to "tethering" or "cradle" stitches, which do not penetrate the transplanted skin, but pass across it and prevent its becoming displaced and penetrate the sound skin near the margin of the graft. For this purpose horsehair is employed, and care is taken not to draw upon the ligature more tightly than will just straighten the sutures that press over and "tether" the transplanted skin.

5. All oozing from the seat of operation having been checked by pressure, a gentle stream of corrosive sublimate wash (1 : 2000) should be allowed to flow over the surface of the graft and the adjoining skin, and thereafter finely powdered iodoform dusted freely over the region of the wound. The graft and immediately adjacent skin is covered with a small piece of cotton or linen rag smeared with iodoform-ointment. This in its turn is covered with a piece of lint soaked in corrosive sublimate solution (1 : 2000), and over

it a pad of cotton-wool. The other eye is covered with lint and cotton-wool, and both are bandaged moderately firmly and the patient enjoined to remain quiet in bed. The bandaging of both eyes helps to keep the site of operation free from all movement.

Unless pain be complained of, or there is some other reason for it, the dressing should not be changed for at least forty-eight hours; but the dressings should be reapplied for six or eight days more to the region of the operation. The stitch uniting the eyelids together and the "tethering" stitch may generally be removed on the fifth or sixth day after operation.

### INFLUENCE OF COUNTRY AND RACE IN THE ETIOLOGY OF TRACHOMA.

DR. S M. BURNETT (Washington) discusses (*Ann. d'Oculistique*, March, 1896) the conclusions of VAN MILLIGAN (see this JOURNAL, January, 1896), and from a general review of the subject, including the materials upon which those conclusions were based, Burnett finds:

1. Trachoma is not an infectious and contagious disease, pure and simple. On the contrary, it is the expression of a diathesis or constitutional tendency, and may arise *de novo* or be excited by an attack of conjunctivitis of any kind. Dirt, filth, unhygienic surroundings, and improper living reduce the resisting power to all forms of disease, and in the case of trachoma still further increase the facilities for acquiring conjunctival inflammation, either primary or by contagion, which hastens the outbreak of the affection.
2. While it is no doubt true that high altitudes do not afford an entire immunity from the disease, there can be no question that trachoma flourishes, as a rule, much less in the mountains than on the plains; in which particular, as in many others, it bears a strong analogy to tuberculosis. He attaches, however, much more importance to the race than the altitude in the matter of immunity.
3. There are races that suffer much from the disease, and there are races which are but little affected; and there is one race in one country at least which seems to enjoy a practical immunity from its ravages.

### TRUE IRITIS AND UVEITIS OF THE IRIS.

GRANDCLEMENT (Lyons) insists (*Lyon Médical*, tom. xxxii. No. 34) on the importance of clearly separating from iritis of the ordinary type certain cases hitherto classified with it, but in which only the posterior layer of the iris, the uvea, is involved. These cases he groups under the term uveitis. Comparison shows that the two affections differ in all respects as to symptoms, course, causes, and cure.

Uveitis is observed exclusively among women; iritis is more frequent among men. Uveitis always affects both eyes; iritis often affects but one. Uveitis lasts for years, and is manifested by slight periodic exacerbations, lasting five or six days; iritis is far more violent in its manifestations, but is cured in a month or two. The usual causes of iritis are syphilis, rheumatism, and gout. These are not the causes of uveitis, which causes are unknown. Atropine is of great value in the local treatment of iritis; but iridectomy is the only effective local treatment for uveitis.

The differential diagnosis during the attack may be made by noting that in iritis there is always marked discoloration of the anterior surface of the iris, which in uveitis is not perceptible. In iritis the pain and hyperæmia are violent; in uveitis pain is almost or quite absent and hyperæmia slight. In iritis, even apart from adhesions, the pupil dilates imperfectly with atropine; in uveitis it dilates freely, except in so far as it is bound down by old synechiæ.

## TRAUMATIC PROLAPSE OF THE IRIS.

DAVID LITTLE (Manchester) has found that for prolapse of the iris it is the best practice (*British Medical Journal*, 1896, No. 1858) to slit up the sac through the whole length of the wound with a Graefe knife, and if the iris remains in the lips of the wound to excise it. Rapid healing takes place, and the best result is a firm and flat cicatrix, with little or no synechia, and the eye is left perfectly safe from future infection. He has never found eserine or atropine to reduce a prolapse, even when it has been very small and recent.

## PARALYTIC SQUINT FROM LEAD-POISONING.

LAGLEYZE (Buenos Ayres) reports (*La Clinique Ophthalmologique*, 1896, No. 8) the case of a man who had received a charge of shot in the palm of the right hand. Some of the shot were removed, some escaped through suppuration, but seventeen remained in the hand. Soon after this he began to suffer with lead-colic, and later shooting-pains, painful contractions of muscles of the extremities, severe cephalalgia, vertigo, and paresis of the right internal rectus. This paresis increased, and, after some months, ended in complete paralysis.

The patient's general symptoms continued. He was very thin, anæmic, skin yellow, nutrition profoundly affected. There had been exacerbations of the symptoms, apparently caused by disturbance of the imbedded shot by use of the hand. Seven years after the injury, and four years after the occurrence of the squint, the remaining shot were removed and prompt recovery of general health followed. But the squint remained, and the power of the muscle improved very little under the use of electricity.

## THE ENDOTHELIAL LINING OF THE ANTERIOR CHAMBER.

A. ALT (St. Louis) has made a prolonged series of investigations concerning the endothelium of the anterior chamber, which he reports in the *American Journal of Ophthalmology*, 1896, Nos. 2–7. He finds that the endothelial lining of Descemet's membrane consists of a single layer of polygonal cells; but that the more or less regularly hexagonal form usually represented is rarely found. This is their condition of rest, but more frequently they are found active with retracted outline, leaving spaces between adjoining cells which are joined by thread-like connecting fibres. This condition of cell-activity was found in normal eyes, more in pathological eyes in which the anterior portions appeared normal, and almost without exception in eyes with pathological conditions affecting the anterior part of the eye. Alt believes that the cells can not only develop into lamellate connective tissue like the cornea, but that they originally develop the vitreous membrane of Descemet.

Regarding the angle of the anterior chamber, Alt thinks that its obliteration in certain cases is not alone due to pressure from behind, but to new-formed tissue, which when contracing pulls the iris periphery toward the sclero-corneal tissue. Schlemm's canal can with propriety be compared with the meningeal sinuses; and Alt has found short channels running into it, apparently connecting it with the angle of the anterior chamber.

The endothelial cells of the anterior surface of the iris do not, Alt finds, form a distinct membrane. These cells are unevenly distributed over the uneven surface of the iris, and may be traced into its wrinkles and crypts. He thinks that the newly formed connective tissue he has observed on the anterior surface of the iris in pathological eyes is in a great measure due to their proliferation.

## Ocular Manifestations of Eye-strain.

Ernest Clarke (London), discussing the various manifestations of eye-strain upon the eye itself, and their bearing upon treatment (*Medical Press and Circular*, 1896, No. 22), states that blepharitis is invariably associated with an error of refraction; and that phlyctenular conjunctivitis has a marked association with ametropia, and the same is true of phlyctenular keratitis. In a large percentage of cases of scleritis he has found a marked error of refraction, and on correcting this with glasses the various remedies have worked like a charm. He believes the first and best treatment for recurrent iritis is correction of refractive errors. Eye-strain may cause an attack of glaucoma under favoring conditions, and there is a distinct association between astigmatism and cataract.

## Illumination and Visual Acuteness.

H. Snellen (Utrecht) reports in the Bowman lecture before the Ophthalmological Society of the United Kingdom (*Ophthalmic Review*, 1896, No. 176) some experiments upon the relation of illumination to the acuteness of vision. It was found that the relation between them was not expressed by any mathematical formula, but that the visual acuity rose with the illumination until the maximum of acuity was reached with an illumination of from thirty to fifty metre-candles (the standard candle placed at one metre). Beyond this increased illumination gave no improvement of vision, provided the retina had become adapted to the light.

Studying the illumination of workshops and factories by actual trial in such places, it was found that with waning light when it fell below 15 mc. work requiring accurate vision was actually impeded; and that this was the minimum that could be allowed. Weber's photometer he has found to be the best practical instrument for measuring the intensity of illumination.

# OBSTETRICS.

UNDER THE CHARGE OF

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## Forceps to the After-coming Head.

Mueller (*Centralblatt für Gynäkologie*, 1896, No. 39) reports three cases in which he applied forceps to the after-coming head. The first of these was a multipara in whom he was able, by pressure and strong traction, to bring the head into the pelvic cavity. He was obliged, however, to introduce forceps to complete the labor. The result was favorable to the mother and child. In his second case, a multipara, version was performed because previous labors had been difficult and prolonged. The forceps was then applied to the head, and with considerable difficulty, aided by external pressure, the head was delivered. The child perished shortly afterward. The cause of fœtal death was pressure of the cranium producing bleeding.

His third patient had breech presentation and a contracted pelvis in addition. In delivering the child considerable difficulty was experienced because the arm was thrown upward, while the muscles of the pelvic floor contracted strongly. Delivery was finally effected by having strong pressure made behind the pubes upon the head, while traction was used in addition. He concludes from his experience that the forceps should not be applied high up to the after-coming head, but that the head should be brought upon the pelvic floor, when the forceps is readily used.

## The Treatment of Eclampsia.

At the recent International Congress of Obstetrics and Gynecology held in Geneva, a discussion upon this important subject took place in which various authorities participated.

Charles, of Lüttich, considered eclampsia as a complex disorder. While the reflex element is very pronounced, still the part played by toxins is no less significant. After referring to the autointoxication evident upon examining the various excretory organs, he stated that these retained poisons might result in dyspnœa, cancer, and paralysis without the development of convulsions, and these cases he would style "imperfect or incomplete eclampsia." While albumin is present in the urine in most cases, it is by no means the inevitable cause of this condition. Among the cases observed by this speaker, the mortality in 151 had been $24\frac{42}{100}$ per cent. for mothers and $41\frac{83}{100}$ per cent. for the children. He had observed the usual predominance of primiparæ in this complication.

Charpentier urged the most thorough examination of the urine of each pregnant patient. Upon slight indications of albuminuria and diminished excretion he would limit the patient's diet strictly to milk, relying largely upon this for the prevention of eclampsia. In the actual presence of convulsions, if the patient was robust and cyanotic, he would bleed. He would also give chloral with milk through a stomach-tube. The inhalation of chloroform and the subcutaneous injection of normal saline solution were also of value. If the patient was not robust and little cyanosis had developed, he would content himself with the use of chloral. In most cases labor came on spontaneously, and delivery followed without assistance. If birth did not end spontaneously, version or forceps is indicated. If the child had perished, craniotomy should be chosen. He did not believe in rapid and forcible dilatation of the birth-canal, but would wait until such could be accomplished without violence. The induction of labor or abortion is rarely indicated in his experience in this condition. Cæsarean section could only be performed amid the most favorable surroundings and in rare cases.

Halbertsma considered the most important question in the treatment of eclampsia to be whether the obstetrician should wait for the occurrence of labor or whether he should interfere at once. In serious cases in prolonged labor, when the patient was more than the average age and the pelvis was contracted or multiple pregnancy present, he would actively interfere. He believes that Cæsarean section is indicated at the termination of pregnancy in the presence of convulsions. He also urged incision of the cervix in suitable cases.

Veit had little confidence in many methods proposed because he did not think the pathology of the affection sufficiently well established to furnish indications for treatment. He would hasten labor by every safe method, would administer morphine in large doses, and try to obtain profuse perspiration. He did not advise operative treatment in these cases.

Byers, of Belfast, had found that morphine tended to lessen the acute catarrhal process in the lungs which often hastens a fatal issue in eclampsia. He urged the vigorous use of eliminative treatment. Where the conditions were favorable he would deliver promptly under chloroform. He urged the importance of rest, milk-diet, purgatives, and warm baths in preventing this complication.

In the discussion upon the views previously advanced Tarnier expressed his great confidence in milk-diet as prophylaxis. He would use this not only with patients who had albuminuria, but with those who showed during pregnancy headache, sleeplessness, and other nervous disturbance. In his clinic from the year 1838 to 1887 the maternal mortality was 37 per cent. From 1889 to 1891 he treated eclampsia with chloroform, chloral, and bleeding, with an increase in the mortality to 38 per cent. His present treatment consists of bleeding, purgation, the use of chloroform and chloral, with rigid milk-diet, milk being given by a stomach-tube if necessary. Under this treatment the mortality had diminished to 9 per cent. Since January, 1896, no case of eclampsia had developed in his clinic.

Pamard emptied the uterus in these cases as rapidly as possible. He had found that chloroform could be used if necessary for forty-eight hours to prevent convulsions.

Audebert called attention to the importance of icterus as a prognostic symptom in these cases. In 34 eclamptic patients 4 had icterus, and of these four three perished.

Queirel, of Marseilles, had but 27 cases of eclampsia in 1200 labors. He ascribed this small number to the employment in his clinic of milk-diet with all cases where elimination was deficient.

Morisani, of Naples, drew attention to the fact that the death of the fœtus is followed by the cessation of eclamptic fits and also of albuminuria. In the fourth and fifth months of pregnancy he would treat these cases by appropriate medicines. At the eighth month he would hasten labor with every possible means. He would employ incision of the cervix if necessary.

In closing the discussion, Charpentier urged that the effect of drugs be tried in each case before recourse is had to operation. When the conditions are favorable he would promptly use forceps or do version. Where dilatation was not sufficient for either of these procedures he would wait and employ medicinal treatment, hoping that the death of the fœtus would lessen the convulsions. He believes that the finger and hand should be employed for rapid dilatation.—*Centralblatt für Gynäkologie*, 1896, No. 39.

### Cancer of the Cervix Complicating Pregnancy.

In the *Rassegna di ost. e gin.*, 1896, Nos. 1 u. 2, Puritano reports the case of a woman, aged forty-seven years, in the fifth month of her ninth pregnancy. Cancer of the cervix was present. The treatment attempted was extirpation through the vagina, but the size of the uterus and fœtus was so great that it was necessary to open the abdomen to complete the operation. Forceps were placed upon the broad ligaments, their handles wrapped in iodoform-gauze, and allowed to remain. Death occurred four days afterward from occlusion of the intestine. Post-mortem examination showed that peritonitis was absent, but that a loop of intestine had fallen into the pelvic cavity. The forceps had nothing to do with the fatal complication, as no adhesion or inflammation was found in their vicinity.

### Cervical Pregnancy.

In the *Atti della soc. ital. di ost. e gin.*, 1896, Bd. ii., Trotta reports the case of a woman, aged forty years, who aborted at two months in her first pregnancy. She had a myoma upon the anterior wall of the uterus, which shut off the cavity of the womb from the cervix. The uterus was extirpated because of the tumor, and on examination it was found that the condition present was virtually an extra-uterine pregnancy, the decidua developing above the tumor in the cavity of the uterus, while the ovum had lodged below within the cervix. The rare condition called "cervical pregnancy" was present in this case.

### A Better Method of Using Glycerin to Induce Labor.

In the *Therapeutische Monatshefte*, June, 1896, Kossmann criticises the large quantities of glycerin (100 grammes) advised by Pelzer for the the induction of labor. Remembering that the ganglia which stimulate the uterine contractions lie in the cervix, Kossmann injected but 5 grammes of glycerin within the cervix, placing a distended elastic bag in the vagina. Uterine contractions promptly followed, with successful labor. Although the elastic dilator aided materially in bringing on labor, the glycerin was thought to have had an important effect. This method is harmless and very efficient.

### PREGNANCY COMPLICATED BY FIBROMYOMATA.

In the *Practitioner*, 1896, No. 337, HAULTAIN reports eight cases of patients in whom pregnancy was complicated by uterine fibromyomata.

Two deaths occurred, one in a case of œdematous fibroid of the anterior uterine wall, with abortion at five months and retention of the placenta. The patient died of exhaustion, and HAULTAIN thinks that the uterus should have been removed, preferably before labor. The second death was after Cæsarean section, in a woman having a fibroid involving the cervix and lower part of the uterine body. Operation was performed after the patient had been in labor twelve hours. Death occurred three days later, whether from sepsis or exhaustion is not stated.

In one case, a fibroid beneath the left broad ligament, the tumor diminished to a small nodule during convalescence. In three cases the tumor was removed after labor, as a polyp or in a broken-down mass. In one case nothing is said in regard to the subsequent history of the patient or tumor after her recovery from labor. In one case it was thought that electricity caused growth in the tumor to cease.

HAULTAIN finds that study of his cases tends to support the following propositions: fibromyomata interfere greatly with fertility by preventing conception and by tending toward abortion. When associated with pregnancy they frequently give rise to much difficulty in diagnosis through masking the symptoms of pregnancy, and by themselves being markedly reacted on by pregnancy. Their association considerably increases the risks of pregnancy by preventing the ready expulsion of the ovum, predisposing to hemorrhage, and complicating the puerperium. As many cases end well without help, treatment must be expectant. Each case, so soon as pregnancy or labor is interfered with, must be dealt with as conditions demand. No one method of treatment, by operation or without, can be universally chosen.

### THE FREQUENCY OF CONTRACTED PELVES IN THE UNITED STATES.

In the *Johns Hopkins Hospital Bulletin*, 1896, No. 65, WILLIAMS gives the result of his examination of one hundred women to determine the pelvic condition present. He designates as contracted only those pelves which presented an oblique conjugate of 11 cm. or less, with internal conjugate of 9 cm. or less; pelves with shortening of 2 cm. or more. In two cases pelves slightly larger than the limit were included in the list, because labor was difficult, one case requiring high forceps, the other difficult breech extraction. In the one hundred women fifteen had contracted pelves; four were rhachitic flat pelves; five were generally contracted; one was coxalgic oblique; one was transversely contracted, of the male type. These women were white in eight cases, and negresses in seven. Eleven of these were born in America.

When these cases were reported thirteen had been delivered, seven spontaneously and six by operation. [Although the series of cases is small, the principle of classification is the true one. No accurate knowledge on this point can be obtained by measuring only cases operated upon, thus omitting the large class of difficult labors often followed by fœtal death or injury to the mother. Our records, obtained by examining several hundred patients as a routine procedure, amply bear out the conclusions of Dr. Williams.—Ed.]

### A Contribution to the Study of Ovulation, Menstruation, and Conception.

In the *Archiv für Gynäkologie*, Band lii. Heft 1, Strassmann contributes a very important paper under the above title. He reports the results of a series of experiments to determine the causation of menstruation. Eight experiments were performed upon bitches, the abdomen being opened under antiseptic precautions and sterile fluid injected into the ovary. It was found that the increase in the vascular tension of the ovary which followed such injections produced the phenomena of menstruation, including the characteristic changes in the mucous membrane of the uterus. Strassmann finds in the results of his experiments an explanation of the discharge of blood which has been so often observed to follow the removal of one or both ovaries or any operation which interferes with the nervous supply of the genital organs. His experiments and the observations of operators show that menstruation results from an altered condition in the vascular tension of the ovaries produced by a nervous stimulus.

The results of his most interesting studies may be summarized in the following description: the ripening of the ovum produces an increase in the vascular tension of the ovary, causing nervous stimulus to be transmitted to the uterus and bringing about the characteristic enlargement and turgescence of that organ and its lining membrane which are observed at menstruation. This increased vascularity of the womb prepares it to nourish the ovum if impregnated. When conception does not occur the ovum escapes, and with it are discharged the surplus blood-supply and epithelial soil which were prepared for it. As has been stated by others, each menstruation is the birth of an unimpregnated ovum.

This teaches us that conception most readily occurs outside the uterus, within the tube, pregnancy usually beginning as an extra-uterine or ectopic gestation. Conception most frequently occurs not immediately after menstruation, as has been supposed, but during the two weeks immediately preceding a menstrual period. Menstruation itself is a sign that conception has not occurred. In reckoning the date of confinement the last day of the last menstrual period, which has usually been taken, should not be considered as the probable time of conception, but a period preceding by a week or ten days the first menstrual epoch at which menstruation did not occur. Thus, if the last day of the last menstrual period is stated to be the first of a given month, the period of gestation should be counted, not from this date, but from the 20th or possibly the 25th of this month. It is believed that a more accurate estimation of the date of confinement can be obtained by reckoning in accordance with these results.

## Extra-uterine Pregnancy.

Studsgaard, in the *Nordiskt Medicinskt Arkiv*, 1896, Band vi. Heft 4, gives the results of his observations of 18 cases of extra-uterine pregnancy observed since 1876 in the Municipal Hospital of Copenhagen. As has been observed by others, most of these were tubal pregnancies. In one instance, upon abdominal section, it was thought that an ovum of two months was an abdominal pregnancy. In this case the ovum could not be traced to tube or ovary, but was found behind the uterus in the small pelvis. Of these 18 patients, 4 were between twenty and thirty years of age and 14 between thirty and forty years; 17 were multiparæ; the characteristic symptoms were present in these cases, including the discharge of the decidua, in one case a cast of the uterine cavity having been expelled; 8 of the 18 patients complained of dysuria caused by interference of the growing ovum with the bladder. Surgical treatment only was considered available, in view of the danger which rupture occasions. It was observed that the cases operated upon before rupture were usually followed by smooth recovery. Four patients operated on during collapse after rupture recovered. In two cases the cicatrix of a former rupture with adhesions was found, indicating that the patients had suffered from this complication on a previous occasion. The vaginal method of operation was reserved for cases where the ovum was of small size and situated within easy access deep in the pelvis.

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## The Frequency of Contracted Pelvis.

At the recent Congress at Geneva, as reported by *La Semaine Médicale*, the discussion upon this subject was briefly as follows:

Fochier had examined 120 pelves post mortem in the anatomical rooms of the medical faculty of Lyons. He found 27 of these contracted, one of them in a remarkable manner, a percentage of contracted pelves of $21\frac{66}{100}$. Among these 22 were flattened, 10 being simple flat pelves and 12 irregularly flattened. The remainder were rhachitic. His clinical observation included 630 pregnant women examined during 1895, among whom were found 120 contracted pelves, $20\frac{16}{100}$ per cent. Of these 42 were simple flat pelves, 58 flat rhachitic, and 20 generally contracted pelves. All pelves were considered rhachitic in which there was a history that the patient had walked later than the average infant. The frequency of transverse presentations in the obstetric clinic at Lyons had led to an effort to find an explanation for this in the peculiar shape of the pelvis among these patients. It was found that in these cases a peculiar flattening of the pelvis was present, which seemed to be an adequate cause for this phenomenon.

Rein, of Kiew, Russia, gave the results, gathered from different Russian clinics, of the examination of 54,000 pregnant patients, among whom were found 2005 pelves whose true conjugate was $9\frac{1}{2}$ cms. in flat pelves and 10 cms. in those generally contracted. He could find but 457 cases of markedly contracted pelves. Sufficient deformity to require Cæsarean section was exceptional. In the Caucasus rhachitis is rare, while in other portions of Russia almost all contracted pelves are rhachitic. In the clinic at St. Petersburg but $\frac{6}{10}$ per cent. of patients examined had contracted pelves. In Russia the most frequent contracted pelvis is the simple flat, and then the generally contracted. Of the 54,000 patients, $1\frac{5}{10}$ per cent. had simple flat pelves and $1\frac{5}{10}$ per cent. had generally contracted pelves. But four cases of osteomalacia were reported.

Kufferath, of Brussels, had recorded pelvic measurements for ten years in 5000 women, making the same measurements with each. He found 75 contracted pelves, of which 71 were flat, with a true conjugate of less than 9½ cms., while 4 were generally contracted with a true conjugate of not less than 10 cms. As regards treatment, he divided his patients into four classes. In the first the true conjugate was from 9 to 11 cms.; delivery was effected by the forceps or version, and rarely by symphysiotomy. If the child was dead, the forceps or embryotomy was employed. In the second class the true conjugate varied from 9 to 7 cms. Premature labor was induced at seven and one-half months. If version or forceps failed at term, symphysiotomy was employed. In the third class the true conjugate was from 7 to 5 cms. Labor was induced at seven months and a half, and symphysiotomy practised if necessary. If the child was at term and the true conjugate from 6 to 5½ cms., Cæsarean section was chosen. In the fourth class the true conjugate was less than 5 cms., and abdominal section was employed.

Fancourt Barnes, of London, reported the results of the examination of 38,065 pregnant women, among whom were found 150 flat pelves, with a true conjugate less than 9½ cms., and 45 pelves symmetrically contracted, with a true conjugate of less than 10 cms.

Treub, of Amsterdam, gave the results of 22,955 labors. Among these patients 816 contracted pelves were found. Of these, 657 were flattened, with a true conjugate of less than 9½ cms., while 159 pelves were symmetrically contracted, with a true conjugate of less than 10 cms. No cases of osteomalacia were found. In treatment, Treub had employed the supine posture or Walcher's position with success.

Pestalozza, of Florence, had examined 7962 patients, of whom 2437 had pelves somewhat contracted; 993 of these patients had such slight pelvic contraction that interference was unnecessary. The most frequent forms were rhachitic, symmetrically contracted, and simple flat pelves. In 50 cases an irregular contraction was present. One case of osteomalacia was among the number. Among other operations 3 symphysiotomies and 14 Cæsarean operations were performed. The maternal mortality was 8 in 1391 clinic patients, and 95 infants. The most frequent contracted pelves were observed in the south and in the vicinity of Naples. The inhabitants of the north and middle portions of Italy were less often afflicted with disease causing pelvic contraction.

Lusk, of New York, reported that in the United States pelvic contraction is exceptional among Americans, rhachitis and osteomalacia being practically unknown.

Pawlik, of Prague, gave the results of the examination of 29,615 pregnant women in the Austrian Empire: $5\frac{9}{10}$ per cent. of these patients had flat pelves, $1\frac{92}{100}$ per cent. symmetrically contracted pelves, and $\frac{14}{100}$ per cent., or 41 patients, had osteomalacia.

Morisani, of Naples, among 2769 labors, found deformed pelves in $4\frac{47}{100}$ per cent. Among these were 50 rhachitic pelves and 13 osteomalacic. Most of the rhachitic pelves were found in patients from the vicinity of Naples. The osteomalacic cases came from the villages at the foot of Vesuvius, and three of these patients had been born in Naples.

# GYNECOLOGY.

UNDER THE CHARGE OF

HENRY C. COE, M.D., M.R C.S.,

OF NEW YORK.

## Shortening of the Round and Sacro-uterine Ligaments per Vaginam.

**Wertheim** and **Mandl** (*Centralblatt für Gynäkologie*, 1896, No. 18) combine the two procedures for vaginal fixation of the retroverted and prolapsed uterus recently recommended, their method being as follows: A free opening is made in the vesico-uterine pouch and the uterus is drawn well downward into the vagina with a volsella, aided by external manipulation. Backward traction on the cervix then enables the operator to see nearly all the posterior surface of the organ, including the tense sacro-uterine folds. The intestines are held upward by a gauze compress, posterior adhesions are separated, and the sacro-uterine ligaments are drawn backward with forceps until the "slack" is taken up and the fundus is kept well forward; the points at which the ligaments are seized are then united with silk or silkworm-gut to their uterine origins, the amount of shortening varying from two and one-half to three inches.

The gauze is removed and the uterus replaced, the round ligaments are exposed by inserting a retractor in the opening, and are drawn down and shortened in the manner already described by the authors. The combined operations are especially applicable to cases in which the uterus is prolapsed as well as retroverted in consequence of relaxation of the vagina and pelvic floor, since both the cervix is drawn upward and backward and the fundus upward and forward. Colpo-perineorrhaphy may be performed at the same sitting. The danger of complications during pregnancy and parturition, noted after Mackenrodt's operation, is not present, since the portio is not directed backward, nor is ascent of the fundus in the pregnant uterus prevented. Vesical and rectal disturbances have not been noted in the cases (three in number) successfully operated upon by the authors.

## Intraperitoneal Shortening of the Round Ligaments by Vaginal Section.

**Bade** (*Ibid.*) reports five cases operated upon according to the method devised by him, independently with Wertheim. He states that when the uterus is non-adherent it is unnecessary to draw the organ downward, since the origins of the ligaments can usually be found by simply pushing up each tube in turn, and they can be gradually brought through the incision. Reefs are taken in each with silk sutures, as close to the uterus as possible, as in the abdominal method (practised by various American surgeons), and the wound is then closed. The same procedure can be adopted in cases of retroflexion with adhesions, after separation of the latter by anterior colpotomy. The advantages over the intraperitoneal operation are the fact that there is no external cicatrix, the complications attendant upon abdominal section are absent, the ligaments can be secured equally well *per vaginam*, and the uterus remains perfectly movable. To Alexander's operation it is preferable because there is a single vaginal wound instead of two external ones, the ligaments are more easily found, and can be drawn out to a greater extent, the effect of the shortening being actually visible, while operations on the uterus, adnexa, or pelvic floor can be performed at the same sitting, without changing the positions of the patient and surgeon. The writer believes that all the good results claimed for the Alexander-Adams operation may be claimed for the vaginal method, while the dystocia resulting from Dührssen's and Mackenrodt's method is absolutely excluded.

## POSITION OF THE NORMAL OVARY.

WALDEYER (*Centralblatt für Gynäkologie*, 1896, No. 30) states that the ovary lies normally in a triangular fossa formed by the round ligament, umbilical artery, and ureter. Behind this fossa is a second, bounded by the obturator nerve, artery, and vein, as they enter the obturator foramen. The former groove (*fossa ovarii Claudii*) may be only slightly defined or so deep that the ovary within it can be neither seen nor felt. Hernial protrusion of the fossa with the ovary may occur either at the greater ischiatic foramen, or beneath the pyriformis muscle, and in the lesser ischiatic foramen.

## VESICO-FIXATION OF THE UTERUS.

DÜHRSSEN (*Centralblatt für Gynäkologie*, 1896, No. 22), after discussing the complications which may be caused by ventro- and vagino-fixation of the uterus, affirms that these can be avoided by closing the peritoneum separately. He describes a recently devised operation, the technique of which is as follows: the usual transverse incision is made anterior to the cervix and the bladder is separated. The vesico-uterine fold of peritoneum is drawn down with forceps, while the cervix is held backward with a retractor and is incised vertically in the median line. The fundus uteri is then seized with bullet-forceps near the origin of either tube, and is sutured with catgut to the vesical peritoneum. Two sutures are used on either side, the upper one being inserted a quarter of an inch above the upper end of the peritoneal wound; the latter is then closed with a running catgut suture, care being taken not to include any of the uterine tissue. The vaginal wound is sutured separately in the same manner. Anterior and posterior colporrhaphy are performed at the same sitting. If the adnexa are diseased, they are resected before inserting the uterine sutures. In five cases operated upon by this method the results were entirely satisfactory.

The results obtained by this operation are anterior fixation of the uterus, with such a range of mobility that neither vesical disturbance nor complications during pregnancy and labor should occur. It is important to note that in cases of vagino-fixation, by whatever method it may be performed, the corpus uteri should be attached only at a point half an inch above the origin of the vesico-uterine fold, else there will result a recurrence of the retro-displacement.

## VAGINAL OVARIOTOMY.

FEHLING (*Centralblatt für Gynäkologie*, 1896, No. 30), criticising a former paper of Bumm in favor of ovariotomy by anterior colpotomy, adds to the latter's five cases seven of his own, in which he shows that in 33 per cent. of the twelve cases it was necessary to perform either abdominal section or vaginal hysterectomy in order to complete the operation. He considers the danger of hemorrhage from the stump as a serious one, after the latter is returned to the cavity. The fact that the blood may escape into the abdominal cavity, and not externally, renders this accident still more embarrassing. Moreover, it is not always possible to make an exact diagnosis of the condition of the opposite ovary, which may thus be sacrificed unnecessarily.

The writer is opposed to the adoption of the vaginal route for the removal of ectopic gestation-sacs, especially through the anterior incision. Having lost a patient from hemorrhage in incising posteriorly a hæmatocele, due to tubal abortion, he has ceased to employ any method except abdominal section.

In spite of the ease with which the vaginal operation can be performed, and the absence of an external cicatrix and subsequent hernia, he regards it as unsatisfactory, since one must always be prepared to perform cœliotomy or even to remove the uterus, the latter being most desirable in the case of young women. Hundreds of retroverted uteri have been vagino-fixed, in many instances unnecessarily, in many with serious results. It is time, the writer believes, to check the indiscriminate performance of this operation, and, above all, to insist that anterior colpotomy for the removal of diseased adnexa must have a limited application.

## THE CONDITION OF THE ENDOMETRIUM FOLLOWING CASTRATION.

ECKARDT (*Centralblatt für Gynäkologie*, 1896, No. 30) calls attention to the fact that, while the condition of atrophy of the endometrium following the menopause has been carefully studied, little attention has been paid to the similar atrophy after removal of the ovaries. The difficulty of obtaining suitable specimens from the human subject has compelled investigators to study the subject experimentally in animals. Krukenberg found that in the uteri of rabbits, examined nine or ten months after castration, there were marked atrophy and fatty degeneration of the uterus, with disappearance of the ciliated epithelium.

The writer had the opportunity of examining a uterus removed from a woman, aged forty-three years, whose ovaries had been extirpated two years before.

Transverse sections through the organ showed that the endometrium was poor in cells, the ciliated being replaced by cubical epithelium with granular nuclei. In some cases the epithelial was directly continuous with the muscular layer, while in others the mucosa was one-half millimetre in thickness. The glands were small and often cystic, rarely without external openings; a few were seen in the muscular layer. The latter was atrophied, with an increase in the connective tissue. Neither fatty degeneration nor round-cell infiltration was observed. The openings of the tubes were obliterated. The writer summarizes as follows: the endometrium of the human uterus after castration undergoes retrograde changes, as in senile atrophy, which are indicated by disappearance of the ciliated epithelium, atrophy of the interglandular cells, and destruction or cystic degeneration of the glands.

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### RESULTS OF ANTERIOR COLPOTOMY.

WENDELER (*Berliner klin. Wochenschrift*, 1896, Nos. 1 and 2) reports 149 operations by Martin and his assistant, with an afebrile convalescence in 89 cases. Contrary to Mackenrodt, the writer regards the operation as entirely free from danger, nor has he noted many instances of vesical disturbance following it. Seven cases of hemorrhage were noted, none of which was serious. The complications noted during pregnancy and labor he affirms are due to improper technique. In order to avoid them the following precautions should be observed: 1. The median vertical incision in the anterior vaginal wall should be made as long as possible—*i. e.*, its lower point should be as near to the meatus as possible without injuring the ureter. 2. The upper suture should always be placed an inch below the top of the fundus uteri, and is so tied that the uterus shall be either not at all or only slightly anteflexed. 3. Catgut is the best suture-material. Pregnancy occurred only once in the 149 cases, and had advanced to the eighth month without any disturbance, the enlargement of the uterus having been continued in a perfectly normal manner.

Sixty-one patients were cured of this symptom, fourteen relieved, and in nine there was no improvement. In not a single instance did the retroversion recur.

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### RECTAL GONORRHŒA IN WOMEN.

BAER (*Deutsche med. Wochenschrift*, 1896, No. 8), among 191 cases of gonorrhœa in women, noted 67 in which the rectum was involved, gonococci being found in the discharge from the bowel.

While infection may result directly from unnatural coitus, the writer believes that in the majority of the cases it is due to contact of the vaginal discharge with the rectal mucous membrane, especially in women with deep perineal lacerations. Infection through thermometers, rectal tubes, etc., is doubtful. Few of the patients presented any marked local symptoms, unless there was an ulceration at the anal orifice. These complained of burning pain during defecation, with discharge of pus and blood. Condylomata and eczema were rare.

On inspection the rectal mucosa was seen to be deeply congested, the folds swollen and glistening, with erosions which bled easily, and were covered with pus. A deep ulceration was found only once, and periproctitis in two cases. The treatment consisted in irrigation of the rectum twice daily, through a speculum, with a 3 per cent. solution of boric acid, followed by bichloride of mercury 1 : 8000, in order to destroy the gonococci, half a litre of each being used. The erosions were touched with argentamin(?), 2 per cent. solution. Ichthyol suppositories were also used with good effect.

## HYGIENE AND PUBLIC HEALTH.

UNDER THE CHARGE OF
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AND

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### DISINFECTION OF WELLS DURING CHOLERA EPIDEMICS.

SURGEON-CAPTAIN P. W. O'GORMAN, in the *Indian Medical Gazette*, July, 1896, says that during a recent outbreak of cholera at Midnapore, which began at a season favorable for its spread, the number of cases (117) was supposed to have been kept down by reason of the introduction of special preventive measures. Cases occurred in all of the six wards into which the place is divided. The European quarter and the central jail were quite free. The former used water from the best well, and either filtered or boiled and filtered it before using; in the latter, especial care is taken of the water and its regular boiling and filtering, and no case of cholera had occurred there during two years. The first person afflicted in the town came from Calcutta, where he contracted the disease, and then contaminated the well in his yard. Two days after his death a relative was attacked in the same house along with a next-door neighbor, whose well was about thirty feet distant from the first, and only twenty feet from a cesspool. The cases spreading, forty-six public and private wells were disinfected with permanganate of potassium, and in a short time the outbreak ceased. From an ounce to an ounce and a half of the salt, according to the size of the well, was dissolved in a bucket, poured into the well, and agitated. If in a half-hour after the addition a specimen of the water showed a red tinge, it was considered that enough had been added; if the red had vanished, more was added until the necessary amount was reached.

E. H. HANKIN, M. A. (*Indian Medical Gazette*, July, 1896), writing on the use of permanganate in combating water-borne diseases, says that in some cases from an excess of zeal too much may be added, and that in consequence fish, frogs, turtles, etc., put into the wells by the inhabitants to keep the water clean, are killed, so that the water becomes putrid, and thus the people are driven to use other untreated sources of supply. In other cases too small an amount is added, so that the pink color at first produced fades in a short time and before any action on the cholera microbes present is likely to have been produced. Enough permanganate should be added to produce a coloring lasting twenty-four hours, and from one to eight ounces is usually sufficient for ordinary wells.

### A New Adulterant for the Preservation of Milk.

Mr. G. Denigès (*Revue Internationale des Falsifications*, ix. 36) finds on analysis of three powdered preparations used in France for the preservation of milk, that two contained chromate of potassium and the other was a mixture of the chromate and bicarbonate. Of the latter, two grammes were recommended for fifty litres of milk, but in one specimen of milk he found three decigrammes. The presence of the adulterant is very easily detected by mixing together equal volumes of the suspected milk and a 2 per cent. solution of silver nitrate, when a red color, varying in intensity according to the amount of the adulterant present, is produced.

### Formaldehyd Gas as a Practical Disinfectant.

Professor E. Pfuhl (*Zeitschrift für Hygiene und Infectionskrankheiten*, xxii. 339) reports the result of his experiments with formaldehyd as a room-disinfectant, using an improved form of Krell's lamps. Miquel, Philipp, and Oehmichen had already reported good results, Miquel concluding that the agent is the only safe and reliable quickly acting means for disinfecting large spaces, thereby disagreeing with Ascoli, who found its action to be not uniformly exerted throughout the room. Dieudonné had tried the Tollen's lamp in a room of 28.4 cubic metres, converting 200 grammes of methyl alcohol into formaldehyd, and using cholera and typhoid cultures and anthrax-spores as test-objects. After twenty-four hours' exposure of the test-objects in the well-closed room, it was found that the cholera and typhoid germs were killed, but not so the anthrax-spores. After another period of twenty-four hours only a part of the latter at about the middle level of the room were killed. On trying a Krell's lamp, with which 320 grammes of methyl alcohol were converted into formaldehyd, all of the organisms were killed within twenty-four hours. Pfuhl obtained seventeen of the improved Krell's lamps, each having a capacity of 200 c.cm., and conducted his experiments in three rooms of 263, 92, and 60 cubic metres capacity. The test-objects, fresh and dried tuberculous sputa, pure cultures of typhoid, cholera, and diphtheria, anthrax-spores, tetanus-spores, streptococci, and staphylococcus aureus, were exposed in open glass dishes about the rooms. The lamps were placed so as to insure uniform distribution of the gas. The duration of the generation of the gas was commonly twenty to twenty-one hours, the experiments beginning mostly between eleven A.M. and noon, and ending at eight or nine A.M , when the doors and windows were opened. In several of the experiments the duration was but fifteen hours. Most of the gas disappeared soon after providing an exit, and one could work in the rooms an hour later, though not with complete comfort. The odor often persisted for two days. On going into a room in which the lamps were still burning almost unbearable irritation of the eyes and nose was caused, and breathing was impossible. The results of the experiments showed in general that much depends on the thickness of the layer of infective material. Thus, one form may be killed after exposure to a certain amount of gas, and again be alive after exposure of a deeper layer to a greater amount of gas, the penetration of the latter being not sufficiently deep.

### RESULTS.

| Test-objects. | Amount of methyl alcohol (converted to formaldehyd) required per cubic metre to kill. |
|---|---|
| Tubercle-bacilli in fresh sputum | 14.1 grammes. |
| Tubercle-bacilli in dried sputum | 15.7 " |
| Other bacteria in fresh sputum | 6.0 " |
| Fresh agar culture of typhoid bacilli | 12.3 " |
| Dried agar culture of typhoid bacilli | 47.1 " |
| Fresh agar culture of cholera-bacilli, not killed by | 14.1 " |
| Fresh agar culture of diphtheria-bacilli | 6.0 " |
| Dried agar culture of diphtheria-bacilli | 21.2 " |
| Fresh agar culture of streptococcus | 4.6 " |
| Dried agar culture of streptococcus | 6.0 " |
| Fresh agar culture of staphyl. pyog. aureus | 14.1 " |
| Dried agar culture of staphyl. pyog. aureus | 62.8 " |
| Fresh agar culture with anthrax-spores, not by | 94.1 " |
| Dried anthrax-spores, not by | 94.1 " |
| Dried tetanus-spores, not by | 94.1 " |

Thus it appears that fresh and dry tubercle-bacilli are killed with comparative ease, but that on the whole the agent is not well suited to general disinfection. Many difficulties present themselves, many lamps are needed, and the agent is a bad one for handling. It cannot be used in a compressed form in cylinders, since it goes from monoformaldehyd into tri-, hexa-, and other higher polymers, which are indifferent bodies, hardly to be considered as disinfectants.

DRS. G. ROUX and A. TRILLAT (*Annales de l'Institut Pasteur*, ix.) experimented with the same agent in a room of 78 cubic metres capacity, burning 5000 grammes of methyl alcohol, and did not succeed in completely killing the various infectious materials exposed.

DR. K. WALKER (*Zeitschrift für Hygiene und Infectionskrankheiten*, xxi. 421) states that formalin (a 40 per cent. solution of formaldehyd) in the strength of one to ten thousand prevents the growth of cholera, typhoid, diphtheria, and staphylococcus pyogenes aureus, and as gas in great dilution greatly restricts their growth; that in 1 per cent. solution pure cultures of pathogenic germs are killed in one hour, and in weak alcoholic solution its action is intensified; and that feces are almost instantly deodorized by a 1 per cent. solution, and by a 10 per cent. solution are sterilized within ten minutes.

DR. NILS ENGLUND (*Om Formaldehyden*, Stockholm, 1895), experimenting to discover which of the processes for disinfecting dwellings with formaldehyd is the most applicable, found that the various lamps were two small and gave uncertain results. Two methods proved to be highly effective against the various bacteria with which the rooms were infected: One by spraying the walls, furniture, etc., with a 2 per cent. solution and allowing the room to remain closed for twenty-four hours; 60 to 70 c.c. of solution are enough for a square metre of surface. The other by evaporation from sheets dipped into a solution of half a kilo of calcium chloride in a litre of formaldehyd and hung in the room. The room is left closed until the next day. A sheet of two square metres is enough for eight cubic metres of space. The agent is found to be particularly useful for furs, books, etc. The method by spraying is a very cheap process, but those engaged in the work must protect the eyes by a special form of glasses, and the hands with gloves or vaseline, and must use a cotton-wool respirator.

[Formaldehyd, the aldehyd of formic acid, is produced when the vapor of methyl alcohol is passed with air over a glowing platinum spiral. It is a colorless, irritating gas, easily soluble in water, and easily oxidized in the air to formic acid.]

### Poisonous Action of Sulphuric Acid and its Salts in Foodstuffs.

Dr. H. Kionka (*Zeitschrift für Hygiene und Infectionskrankeiten*, xxii. 351) shows that sulphite of sodium in practical doses exerts on cold-blooded animals an injurious effect on the heart and a paralyzing action on the central nervous system, and that in large doses it is rapidly fatal to warm-blooded animals. Moderate doses, such as would agree with the amount of the substance prescribed in the directions for use of food-preservatives containing it, were found to affect seriously the lungs and kidneys. These preparations are extensively used by sausage-makers and others for the preparation of sausages, meats, wines, beers, canned vegetables, and fruit. In his experiments large doses were used, but the continued small doses with food are regarded as unwarrantable. Even after cooking, at least two-thirds of the amount originally present are retained. Thirty-one dry meat-preservatives examined consisted of sodium sulphite with more or less sodium sulphate, bisulphite, and chloride, and in some cases borax; but in general they were mixtures of sulphate and sulphide. Fourteen liquid preservatives proved to be mixtures of sulphite and sulphate of calcium or of sulphite, sulphate, and bisulphite of sodium. Tinned foods do not need any preservative, as they are sterilized by heat; but those put up in glass, which easily breaks in the process, are often so adulterated. Sendtner (Munich) found in thirty-two samples from 26.4 to 482.6 milligrammes per jar.

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# THE TREATMENT OF BACKWARD DISPLACEMENTS OF THE UTERUS.

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It has been the task of the present generation of gynecologists, and the special work in particular of Prof. B. S. Schultze, of Vienna, to demonstrate the fact that the normal uterus is not fixed, but occupies a variety of positions in the pelvis at different times, according as it is influenced by the movements of contiguous structures, and most of all by the bladder, empty, partially distended, or full. The position of the uterus we now know to be one of mobile equilibrium, in which, however, the fundal end remains directed anteriorly and the cervical end posteriorly; ante-positions, whether anteflexions or anteversions, are rarely pathological.

On the other hand, any persistent posterior position of the uterus in which the fundus is displaced back into the hollow of the sacrum, or is found lying in a plane posterior to the cervix, is abnormal. Backward displacements constitute one of the most important gynecological questions of the day for two reasons: in the first place, because of their extreme frequency; and, in the second place, because we are still in an evolutionary stage regarding their treatment.

As there can be no rational treatment without a consideration of the particular causes acting to produce the displacement in each case, I shall briefly enumerate those most frequently found:

1. Congenital causes, due to a short vagina or to an imperfect development of the uterus, in which the retroposition has existed from childhood.

2. Retropositions developed acutely by sudden or severe strain.

3. Retropositions caused by tumors in the uterus or adnexæ.

4. Retropositions, the sequelæ of pregnancies, due to subinvolution of the uterus, or to injury of the pelvic floor, or to both combined.

Just as it is important to bear in mind the cause of the retrodisplacement, so is it important to study carefully the symptomatology in each case, for, as the symptoms are mild or severe, more or less energetic plans of treatment will be required.

In many instances, including also the congenital forms, the discovery of the malposition is purely accidental and the patient, who suffers no inconvenience whatever, will require no treatment of any kind. In others both the local and the general symptoms are marked, the local symptoms being due to the flexion or version effecting a stasis in the circulation, a sense of dragging due to the associated descensus of the uterus, with pain in the back and legs. The interference with the blood-supply of the uterus naturally produces its most distressing symptoms at the time the congestion of the organ is greatest—at the menstrual period. Backache and dragging pain in the sides are due to the tugging on the broad ligaments arising from the tendency of the displacement to increase as it advances through the various stages of descensus and prolapsus. Locomotion may be difficult and painful, and the mechanical interference with the rectum or with the distention of the bladder by the misplaced fundus not infrequently seriously interferes with the special functions of these organs.

The general symptoms produced by retrodisplacements, while they are often called reflex, are in reality more frequently due to the disordered state of health produced by the local discomforts, keeping the patient house-ridden and interfering with her taking fresh air and exercise. We find, therefore, as we might expect, such products of malnutrition as anæmia, nausea and indigestion, constipation, headache, and hysteria.

Treatment. By taking up any one of the numerous text-books on gynecology written fifteen or more years ago, it will be seen that the treatment of retropositions, both flexions and versions, was then conducted by using curved uterine sounds or so-called " uterine repositors," introduced into the cavity of the uterus and twisted or bent to force the fundus into an anterior position. These " repositions " were then followed by a vaginal pack or the use of a pessary. It is not without significance to note, too, that this was also the period of active treatment of anteversions and anteflexions in exactly the same way.

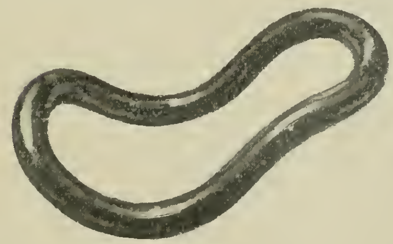
Now, we have absolutely given up the use of the sound or repositor or of instruments of any sort within the uterus, and find only a limited field of utility for the pessary. Instead, the most efficient plans of treatment at present, where treatment is required, are purely surgical, attacking the displacement either through the vagina or abdomen, or through both avenues at once.

The correct method of dealing with any given case of retrodisplacement will fall under one of the following heads:

1. Cases in which no treatment is required.
2. The use of a pessary.
3. Manual reposition and massage.
4. Operation upon the vaginal outlet.
5. Operation on the uterus at the vaginal vault.
6. Shortening the round ligaments.
7. A suspensory abdominal operation, or ventrofixation.
8. An operation upon the vaginal outlet and a suspensory operation combined.

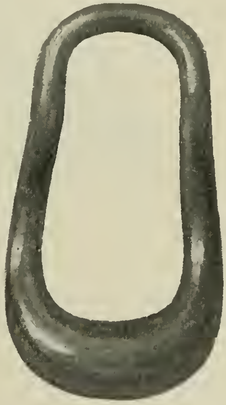
*No treatment.* As I have already said, where the discovery of the flexion is the accident of an examination, or where the patient's distress is purely mental, imagining that she cannot have good health with the uterus "out of place," the physician should quiet her mind by assuring her that she runs no risk, and should advise against any treatment whatever.

FIG. 1.



Smith-Hodge pessary with somewhat rounded anterior bar. This is the size most commonly used.

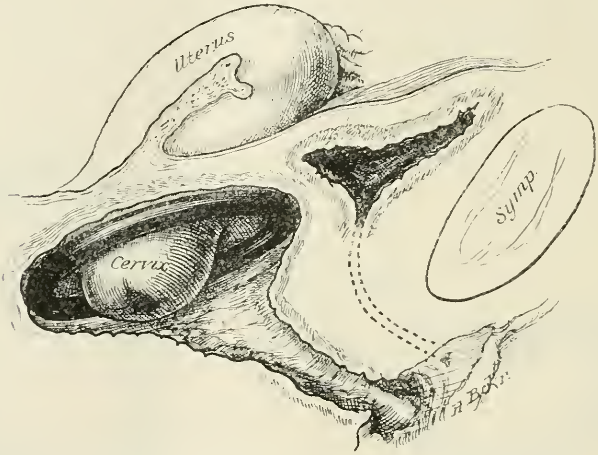
FIG. 2.



Mundé pessary, particularly useful in retroflexions, on account of the reinforced posterior bar.

*Pessaries.* A pessary is often useful in relieving the local symptoms of the displacement, and it does this, as a rule, not by correcting the displacement, but by checking the tendency to still greater displacement. In other words, many of these retrodisplacements are only the initial stages in the formation of a marked descensus or even a prolapsus of the uterus; and if the patient were to be examined some months later the descensus would be observed, and later the cervix would be found at the vaginal outlet, and at a still later date protruding from the vaginal orifice. The pessary obviates this tendency to extreme downward displacement, and, taking the tension off the broad ligaments, relieves the sensation of "dragging" and "falling out" so often complained of. I would insist that retroversions and retroflexions are but rarely cured by the use of the pessary, and this in spite of the numerous statements to the contrary which might easily be adduced from earlier writers. The only pessaries I ever find use for are the Hodge pessary, with a flat nose; very rarely the Smith-Hodge pessary, with a pointed nose; quite frequently the Mundé pessary, like the Hodge, but with a thick posterior bar; and still more frequently a hard-rubber ring-pessary. In choosing a pessary for a particular case, one must be selected which fits the vagina nicely without making pressure upon any of its walls or stretching it in any direction. The large pessaries, "horse-pessaries," which draw the vaginal walls out tense in all directions in order to prevent the descensus, are to be absolutely rejected. They always in the end either increase the relaxed condition of the vagina or ulcerate through its walls. The smaller pessaries fit loosely, gently splint the vaginal walls, and so limit the excursive movements of the uterus. There should be room on all sides to insert the finger easily between the pessary and the walls embracing it. The soft-rubber ring-pessaries, although convenient to introduce, ought never to be used, as they soon become foul and produce irritating discharges. The patient with a simple retroflexion will often experience relief from the insertion of one of the hard-rubber rings or a Hodge pessary, when she may go home

FIG. 3.

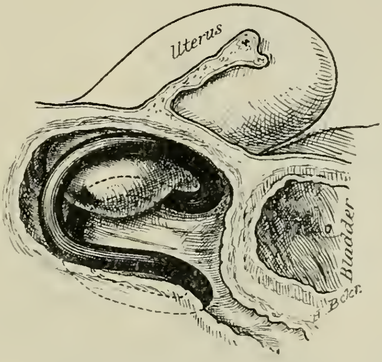


Showing the mechanism of support by the simple hard-rubber ring-pessary.

and need no further treatment. I can hardly give any definite rules for the use of any one of these particular forms of pessary, as the selection seems to be rather a matter of instinctive judgment. I find that the Hodge or the Hodge-Mundé does best in nulliparous women; in parous women, when the vaginal outlet is somewhat relaxed, the best instrument, without doubt, and often the only one which will stay in, is the cradle-pessary.

The simple hard-rubber ring, although more painful to introduce, when once in is less apt than the others to press on tender points and is in consequence more easily worn.

Fig. 4.



Cradle-pessary in place, showing the absence of a posterior bar.

*Manual reposition and massage.* When there is no lateral disease in the pelvis, and where the uterus is movable and the vaginal outlet is not broken down, the following plan of manual reposition may be used a few times, in the hope of effecting a cure by simple means:

First, the cervix is caught by a pair of tenaculum-forceps and drawn down to the vaginal outlet; by pulling the uterus down in this way, although the displacement is increased, the angle of flexion is straightened out.

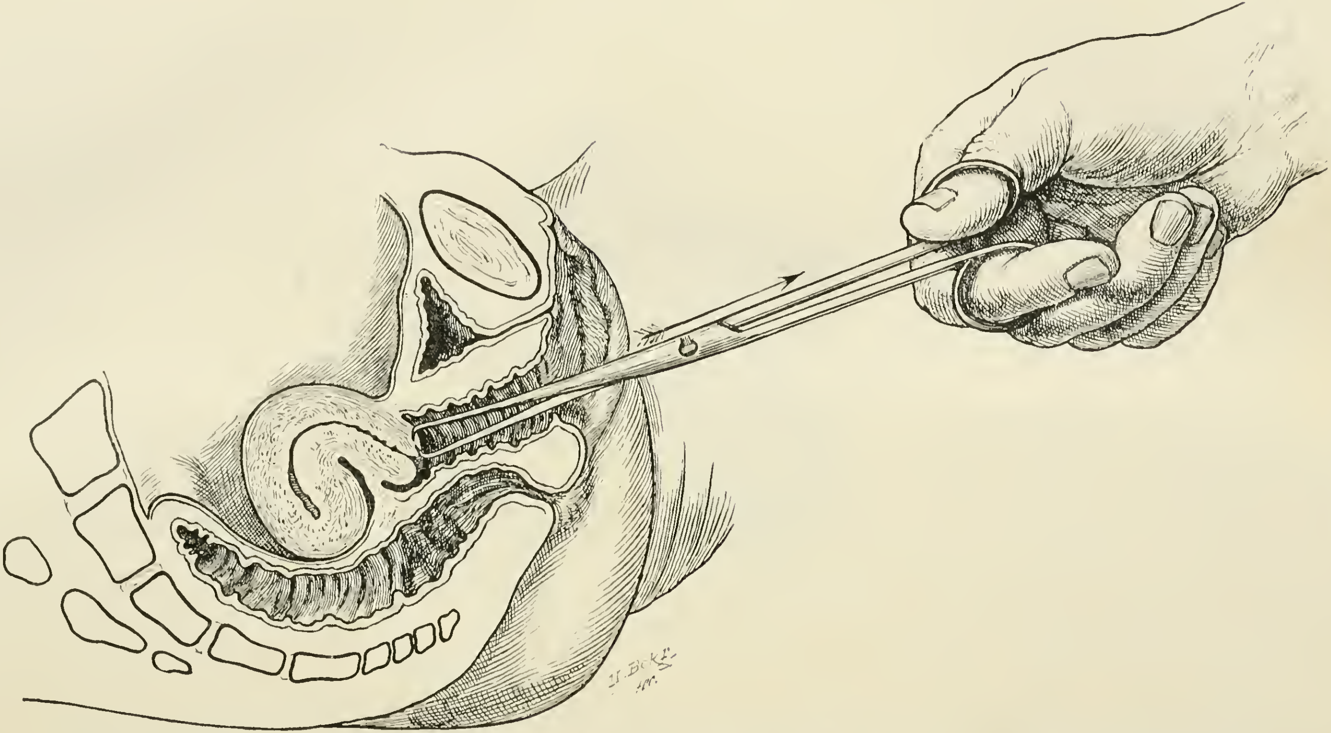
Second, with the index-finger in the rectum, the fundus of the displaced uterus is pushed forward.

Third, the cervix, held by the tenaculum-forceps, is pushed high up into the sacral hollow, into the place previously occupied by the retroflexed fundus.

Fourth, if an assistant will hold the cervix in this position, the operator can easily bring the fundus into extreme anteflexion by grasping it bimanually through the vagina or rectum and the abdominal walls.

While such a procedure is often easily carried out on an examining-table, with sensitive patients, or where the abdominal walls are thick,

FIG. 5.

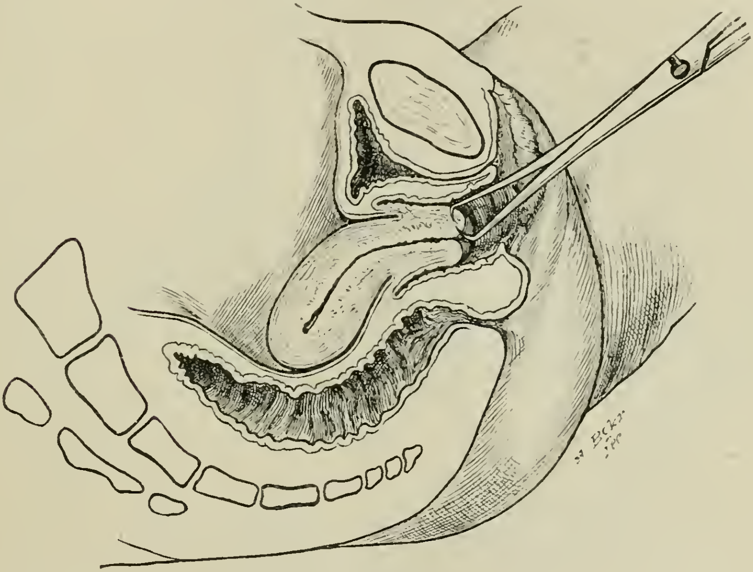


Reduction of retroflexion. The anterior cervical lip of the retroflexed uterus is caught with tenaculum-forceps, and traction is made in the direction indicated by the arrow; this straightens the uterus, as shown in the next figure.

it will sometimes be necessary to use an anæsthetic. Such a mode of treatment should be preceded by a careful evacuation of bladder and rectum.

Where the fundus of the uterus is dislodged with difficulty from the utero-sacral hollow, it will often be of great assistance to put the patient in the knee-breast position, so as to inflate the rectum with air while pushing the fundus forward, and carrying the cervix back into the sacral hollow. Then placing her back into the dorsal posture the fundus will easily be brought into extreme anteflexion.

FIG. 6.

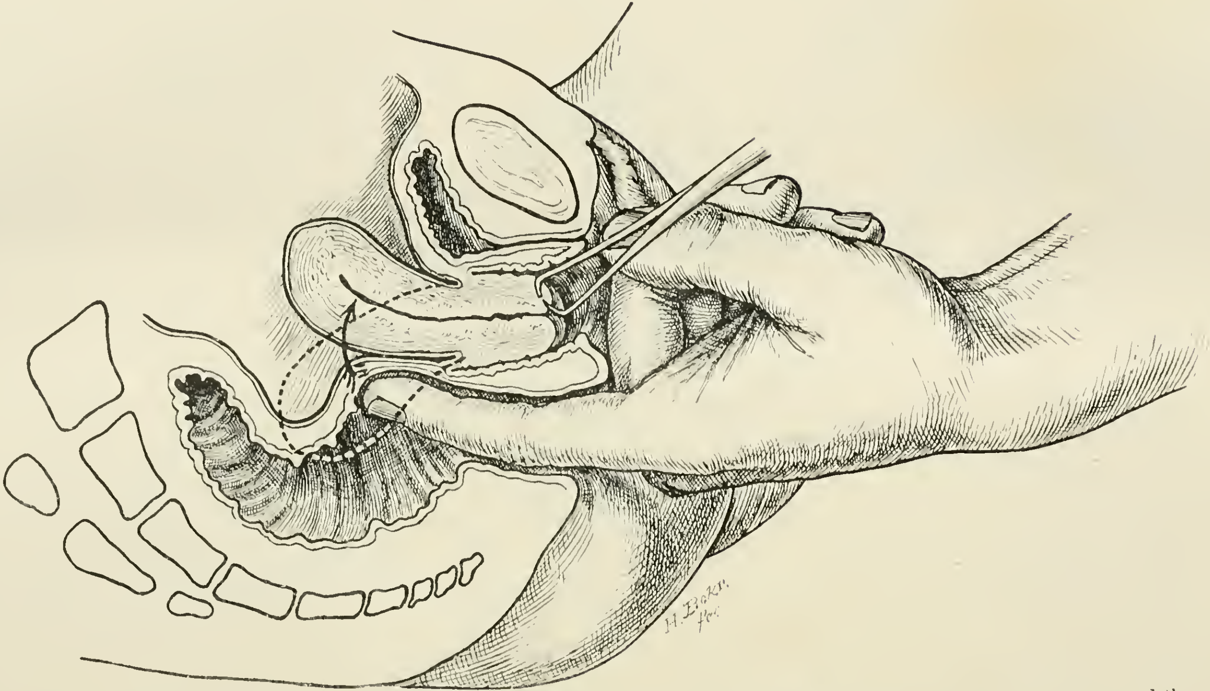


Retroflexed uterus shown straightened by traction of the cervix down to the vaginal outlet.

After replacing the uterus it must be held in its new position, until the next treatment is given, by pledgets of cotton saturated with boroglyceride skilfully placed in the upper part of the vagina, and a wool-tampon below. The object of this pack is to give an elastic support to the cervix, holding it as far back as possible in the sacral hollow. To this end the packs should be applied in front of the cervix and no cotton should be placed in the posterior fornix.

*The vaginal operation for retroflexion.* The treatment of retroflexions by an operation through the vagina, although simpler than any abdominal operation for the same purpose, and a course less liable to meet with opposition on the part of the patient, was, strange to say, one of the last methods to be proposed. In Germany, where the suggestion originated, the names of Mackenrodt and Dührssen have been

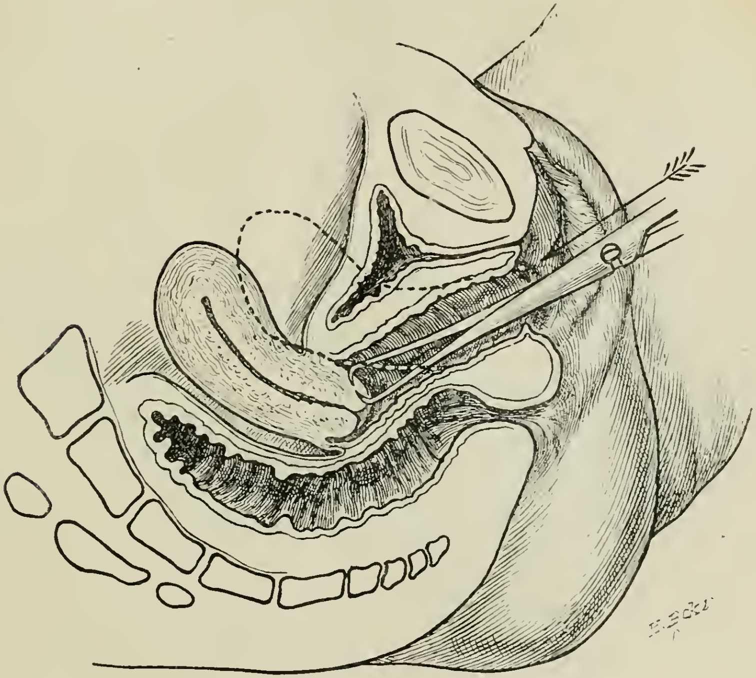
FIG. 7.



While the cervix of the straightened uterus is held down at the vaginal outlet the index-finger is introduced into the rectum and the fundus pushed forward in the direction of the arrow to the position shown in the drawing.

most prominently connected with vaginal fixation. The operation consisted in an incision, either longitudinal or transverse, through the vagina in front of the cervix, for the purpose of detaching the bladder from the uterus, and then of bringing forward the fundus and fastening it in such a way as to secure a permanent anteflexion. The mechanical results of the operation were satisfactory, for the uterus remained permanently anteposed.

Fig. 8.



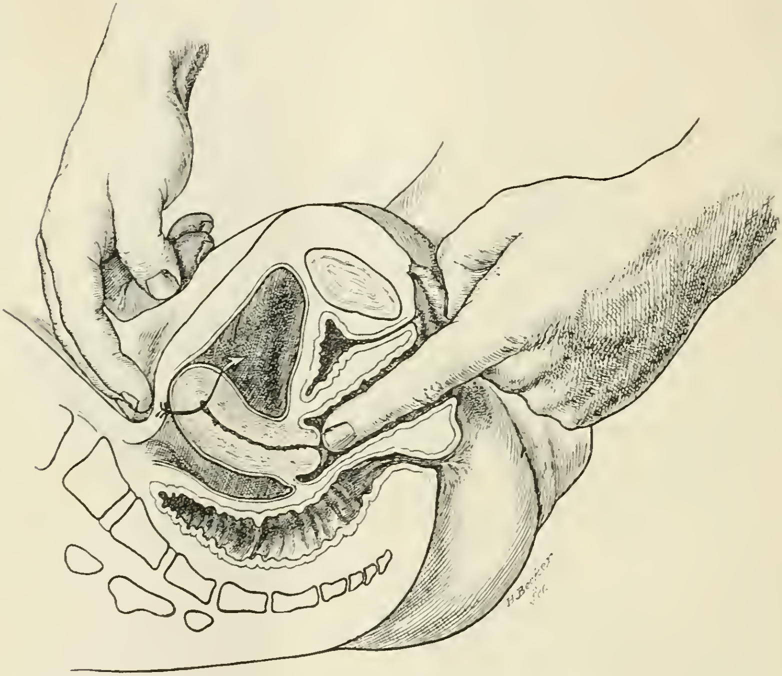
The position of the uterus in the last diagram is here shown in dotted outline. The next step is to thrust the cervix back in the direction of the arrow, into the sacral hollow, giving the uterus the position shown in the drawing.

In America this way of treating anteflexion has never been more than sporadically practised, while in Germany it has now been almost completely given up on account of the serious difficulties encountered in case of pregnancy. The firm adhesions between the uterus and the anterior vaginal wall hindered the development of the pregnant uterus and produced such abnormalities in the position of the child as sometimes to necessitate severe operative procedures to effect delivery. A careful consideration of this subject has been undertaken by M. Graefe, of Halle, who presented his results to the Leipzig Obstetrical Society, October 21, 1895, reported in *Monatsschrift f. Geburtshülfe und Gynä-*

*kologie.* After reciting the difficulties he has encountered, Graefe announces that in future he will employ vaginal fixation only in women who have passed the climacteric.

An operation purely American is the method of Dr. W. R. Pryor, of New York, described in the *Medical Record*, July 20, 1895, under the title "A New Method of Treating Adherent Retroposed Uteri." Dr. Pryor attacks the posterior cul-de-sac, incising it broadly and opening the peritoneum through the vagina. The fingers are introduced through this opening and any adhesions broken up. An iodoform-gauze pad is now inserted into the pelvis behind the cervix, with the patient in the Trendelenburg position. By this posture the small intestine is made to escape into the abdominal cavity and a second pad is inserted into the pelvic cavity, when the table is lowered to a horizontal position. The pads are now withdrawn from the pelvis and a wad of gauze inserted in the opening just within the cut edges. The uterus is now brought into anteflexion bimanually, taking care not to displace the

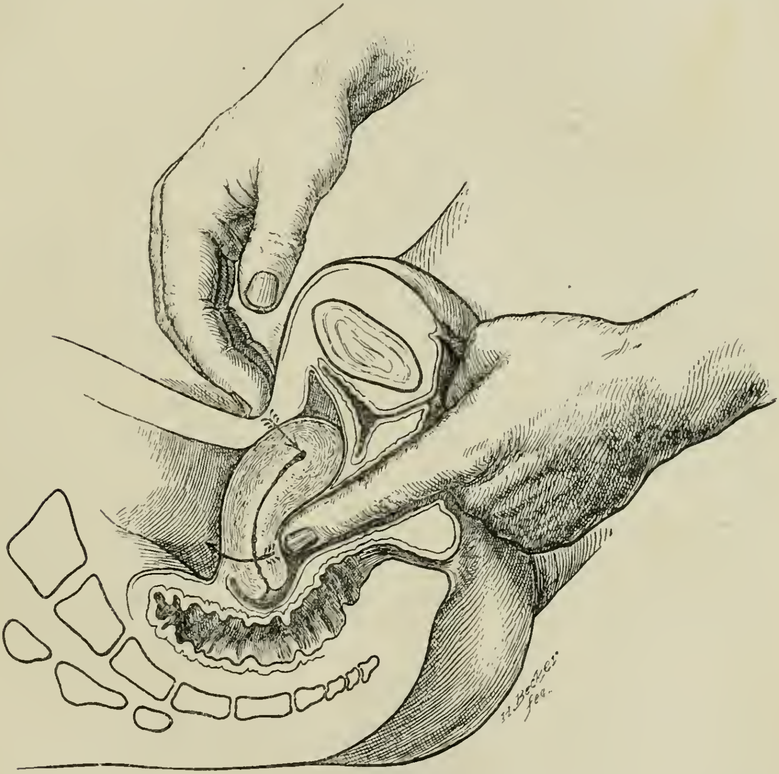
FIG. 9.



The fundus is now in a position to be caught easily bimanually The forceps are removed, and while the index-finger of one hand continues to push the cervix back, the other hand takes hold of the fundus and scoops it over into anteflexion, in the direction of the arrow.

gauze. It is important that the cervix should be held high up throughout the convalescence, so that the intra-abdominal pressure will fall on the posterior surface of the uterus. The wad of gauze in the cul-de-sac is not disturbed for from seven to ten days, when it is carefully removed and replaced, under chloroform, with the patient in the Sims's position. A week after the first dressing another is made, and in five days this, too, is changed; the vagina is kept packed for a month to support the uterus. The result in Dr. Pryor's method is to produce a dense mass of lymph about the utero-sacral ligaments, and the operation pulls the posterior pole of the uterus back, while it does not affect the mobility of the fundus, as all other operations do. This is in direct line with some of the practical suggestions made by Sänger, of Leipzig, in the early history of the operative treatment of retroflexions. The subsequent histories of two of Dr. Pryor's cases, communicated by letter,

FIG. 10.



The vaginal finger then pushes the cervix up toward the promontory, while the outside hand forces the fundus down into an exaggerated anteflexion.

show that such patients may go through a normal pregnancy afterward.

Dr. H. T. Byford, of Chicago (*Medical News*, October 31, 1896), advocates a plan of operating, used in ten cases, by which the adhesions of the uterus to the bladder are less extensive than in the usual vaginofixation cases ; he shortens the round ligament also through the vaginal incision. The reaction, however, of the profession against vaginal operations for retroflexion is now so strong that it is doubtful whether even such skilful operators as Dr. Pryor and Dr. Byford will be able to stem the tide turning in favor of direct methods of treatment from above through the abdomen.

The operation advocated by Wertheim (*Centralblatt f. Gynäkol.*, No. 10, 1896) also attacks the round ligaments through a vaginal incision. The vagina is incised, the bladder detached from the uterus, and the round ligaments caught and drawn into the vagina, where they are attached to the borders of the incision.

*Shortening of the round ligaments* (Alexander's operation). The extraperitoneal shortening of the round ligament was one of the first and seemingly the most rational forms of operation proposed to relieve retrodeviations of the uterus. The *rationale* of the operation depends upon the assumption that the round ligaments are important anatomical structures in the retention of the uterus in anteposition. It must therefore be assumed that, in cases of retrodeviations or retroflexions, relaxation and lengthening of the round ligament have taken place. The operation is performed by an incision into both inguinal canals, without opening the peritoneum, and so catching up and drawing out the round ligaments until the body of the uterus is brought strongly forward. This form of operation has the advantage of little risk, and some operators have handled a long series without a death ; for example, McGannon (*American Gynecological and Obstetrical Journal*, August, 1896, p. 202) reports ninety-one cases without a death ; four pregnancies, with three normal deliveries.

The disadvantages of the operation are that the ligaments are sometimes found with great difficulty or not at all, and that relapses are not infrequent. The results, also, vary widely in the hands of different operators.

The most satisfactory plan for shortening the round ligaments is that elaborated by Dr. G. M. Edebohls, of New York (*Annals of Gynecology and Pædiatrics*, October, 1896, p. 26), who proceeds in the following manner :

The whole length of the inguinal canal is opened up, and the ligament drawn out at the internal ring and shortened by stripping it out of its peritoneal investment as it is pulled outward. The wound is then closed after the manner of the Bassini operation for inguinal hernia.

Dr. Edebohls has operated on one hundred and sixteen cases in this way, with only four failures. Twelve of the cases became pregnant, with two abortions, six normal labors, and four not yet delivered.

*Treatment of ventrofixation or suspension of the uterus.* I conceived the idea of attaching the retroflexed uterus directly to the anterior abdominal wall above the symphysis, operating through an abdominal incision, early in the year 1885, and carried it out in the case of Miss W., April 25, 1885. This was about the time when abdominal surgery began to make such strides in all directions, and I found while visiting Europe in the summer of 1886 that Prof. Sänger, of Leipzig, Prof. Werth, of Kiel, and Lawson Tait had already performed similar operations to correct a retroflexion found incidental to an abdominal operation for diseased appendages.

The first article on the subject of ventral operations in prolapse and retroversion, by Prof. R. Olshausen, appeared in the *Centralblatt f. Gynäkologie*, October 23, 1886, twelve days before my own paper was read before the Philadelphia Obstetrical Society (*American Journal of Obstetrics*, January, 1887, pp. 33 and 67). Prof. Olshausen also quoted Prof. Koeberlé, of Strasbürg, who performed cœliotomy for retroflexion, in the year 1877, in a case of persistent constipation endangering life, produced by the pressure of the retroflexed fundus upon the rectum.

The technique of all these early operations belongs to the crude experimental stage in the surgical treatment of retroflexions, which has now been carefully elaborated so as to leave little to be desired; for example, the first effort to hold the misplaced uterus forward was made by utilizing the stumps after the removal of one or both ovaries or tubes, attaching them either laterally to the incision, or fastening them in the incision itself. Olshausen made use of the round ligaments close to the uterus, bringing the anterior face of the uterus up against the abdominal wall.

In 1889 and 1890 I made an effort to simplify the technique of the operation and to avoid a peritoneal incision in the following manner: After emptying the bladder and bowels the retroflexed uterus was brought into anteflexion bimanually, and then by means of two or three fingers in the vagina was pushed up against the anterior abdominal wall just over the symphysis with enough force to make a decided elevation there. A large, curved needle threaded with silkworm-gut was then passed boldly through the skin, muscle, and peritoneum; then through the uterus, to be brought out again through peritoneum, muscle, and skin. The silkworm-gut suture, introduced in this way, caught the uterus on its posterior surface near the fundus, and held it well in anteflexion. The patient was then kept quiet in bed, and the suture held in place by means of shot clamped on each side close to the abdominal wall. The shot was kept from cutting through the skin by resting on a silver plate with slits in it to accommodate the silkworm-gut. After a week or ten days the suture was cut on one side and drawn out. I recall five cases in which this plan was tried, and in every one of them the success was only temporary, and I was obliged later to open the abdomen and make a direct attachment of the uterus to the abdominal wall. (*Vide* J. W. Williams, *American Journal of Obstetrics*, 1890, p. 729.)

The method which I now employ and have tested in a long series of cases with the most satisfactory results is the following: In the first place, the case is carefully selected, avoiding patients who are simply hysterical and whose complaints are of a general nature in no way dependent upon the local lesion. I also refuse to operate upon cases in which the symptoms are not pronounced and in which the patient applies for treatment simply because she imagines that she cannot have good health as long as the retroflexion exists. Taking, then, the class of cases in which marked and persistent symptoms are produced by the local affection, and in which the simpler measures described fail to give relief, the operation is performed as follows:

The instruments needed are a needle-holder, curved needles, scalpel, silk suture, two pairs of artery-forceps, silver wire and catgut, and an elevator.

After due preparation of the patient and careful evacuation of the bowels and bladder, she is placed upon the operating-table with hips elevated. It is best to leave her in this position one or two minutes before opening the abdomen, in order to allow the intestines to gravitate toward the diaphragm. An incision 3 to 4 cm. long is then made just above the symphysis pubis, in cases in which the abdominal walls are thin or of medium thickness; a longer incision may be necessary in stout women. The length of the incision is less than that in any other abdominal operation except for the evacuation of ascitic fluid, and owing to its low position the scar is in time completely hidden, in the course of a year or two being scarcely visible.

The peritoneum is opened the full length of the skin-incision, and caught at once on both sides with forceps and drawn outward. One or two fingers are now introduced through the incision and the fundus of the uterus caught and raised into anteflexion.

I invariably use as a suture-material for suspending the uterus a medium-sized silk about a half millimetre in diameter; catgut absorbs too quickly to insure a permanent adhesion between the uterus and the anterior abdominal wall, and I have had no experience with silkworm-gut or silver wire because the silk is so much easier to handle and has given such perfect satisfaction.

The suture is passed in the following manner: one side of the incision is lifted up by two fingers so as to expose a portion of the anterior abdominal wall on its peritoneal surface. The movable peritoneum and subperitoneal tissues are then transfixed with a curved needle at a point 1 or 2 cm. away from the lower angle of the incision. The amount of tissue taken in is about 1 cm. in width and 2 or 3 mm. in depth ; the same suture is then passed through the posterior face of the uterus 1 or 2 cm. back of the fundus, and finally brought out through the peritoneum and subperitoneal tissue on the opposite side of the abdominal wall at a point corresponding to that of entrance. When this suture is tied it at once brings the uterus up snugly against the anterior abdominal wall in anteflexion.

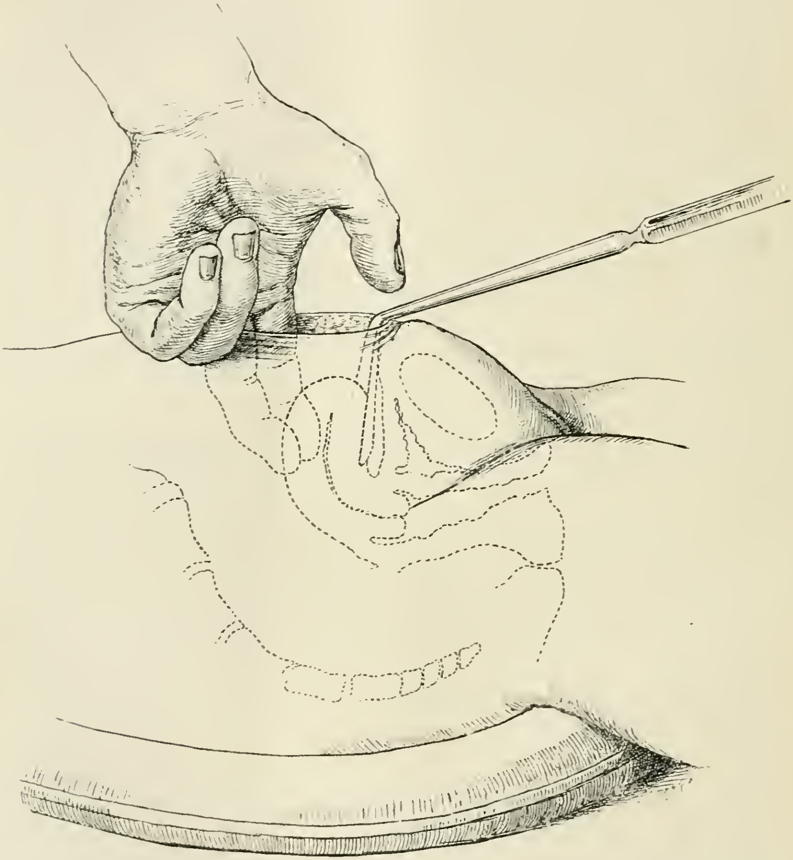
One more suspensory suture is all that is needed to hold the uterus permanently in anteposition. This is passed like the first, but about a centimetre higher up on the abdominal wall and a half-centimetre below it on the posterior surface of the uterus. This is tied, and the abdominal wound closed by sewing up the peritoneum with a continuous catgut suture, then drawing together the fascia above the muscle with one or two silver wire mattress-sutures, and finally closing the superficial fat and skin with continuous catgut sutures. Before completely closing the peritoneum the patient should be dropped to a horizontal position to let the air out from the peritoneal cavity.

Sometimes when the uterus is brought forward out of retroflexion the fundus lies so deep in the pelvis and is so completely covered by coils of intestine that it is exceedingly difficult to get at it to pass the first suture ; in the average case the symphysis pubis forms a satisfactory point of counter-pressure to support the fundus pressed against it by two fingers, while the first suture is being passed ; but in the class of cases referred to, when this simple manœuvre does not avail, the fundus may still be brought within easy reach by using an elevator, in the manner shown in Fig. 11, to form an artificial point of counter-pressure during the introduction of the suture.

Upon closing the incision a simple dressing of dry sterilized gauze is applied, and the patient is kept in bed for three weeks. After getting up she ought to take only gentle exercise for some weeks longer, and for at least six months avoid lifting and heavy work. The bowels should be kept emptied at regular intervals, and, above all, the bladder should be emptied not less than once in three or four hours, according to the amount of excretion ; it is possible for an overdistended bladder to tear a suspended uterus away from its moorings.

Between October, 1889, and October, 1896, I have operated upon two hundred cases of retrodisplacements in the Johns Hopkins Hospital, and upon nineteen in my private hospital. In addition to these there were some cases operated upon outside of these two institutions. In no case has there been a death in any way connected with the operation either during the convalescence or at a remoter period, and I know of no case in which there has been a hernia or any serious interference with any function of the bladder. In tracing the subsequent histories I have learned of pregnancy in fourteen cases, in but one of which was there any difficulty attributed to the operation; that was one of the earliest cases, operated upon in 1889, in which a protracted suppuration in the wound brought about such dense adhesions between the fundus and the abdominal wall that the patient, at the termination of her labor some years later, was only delivered by the forceps.

FIG. 11.

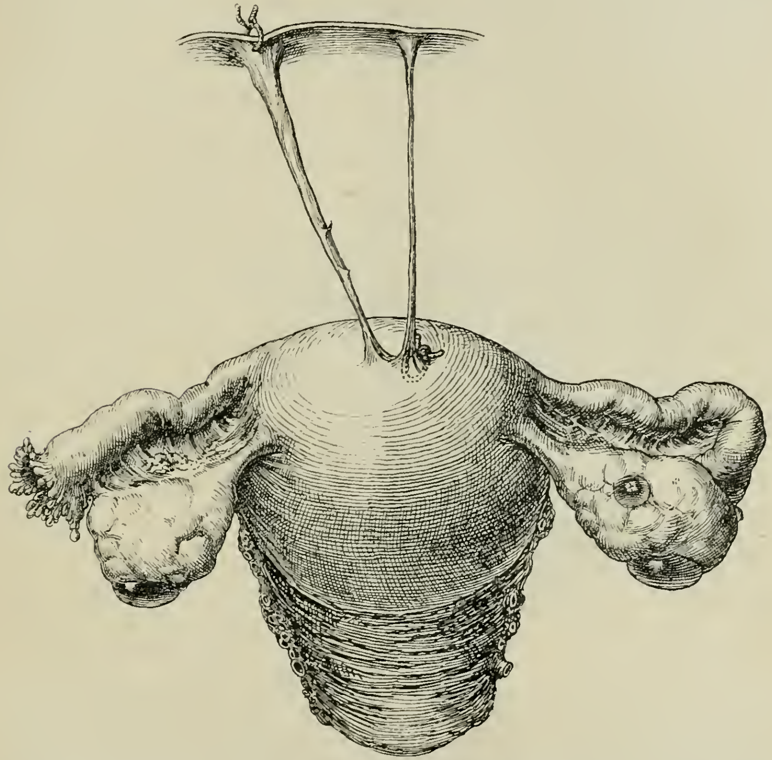


Elevator used as a *point d'appui* during the passage of the first suture through the uterus.

I am not able to state with certainty the exact number of relapses into retroflexion, as I find it impossible to secure the subsequent histories of all my cases; I have seen, however, but four failures.

The operation just described relieves the retroflexion by holding the uterus in a position of great mechanical advantage to meet the forces which tend to displace it. The intra-abdominal pressure now falls upon its posterior surface, and instead of tending to produce a retroflexion actually increases the anteflexion. While the immediate effect of the operation is to fix the uterus to the anterior abdominal wall (ventrofixation, hysteropexy), this is not the final result obtained, which is a suspension of the uterus by its posterior surface, allowing it the full freedom of all its normal movements; if, for example, the patient is examined two or three months after the operation, the body of the uterus will then be found lying in easy anteflexion in contact with the anterior abdominal wall; the examiner will also find that he is able to raise it without resistance and to push it backward or sidewise; one position, however, it will not take: he cannot throw it again into retroflexion. The explanation of this freedom of motion and this restriction is found upon opening the abdomen, as I have done in a number of

FIG. 12.

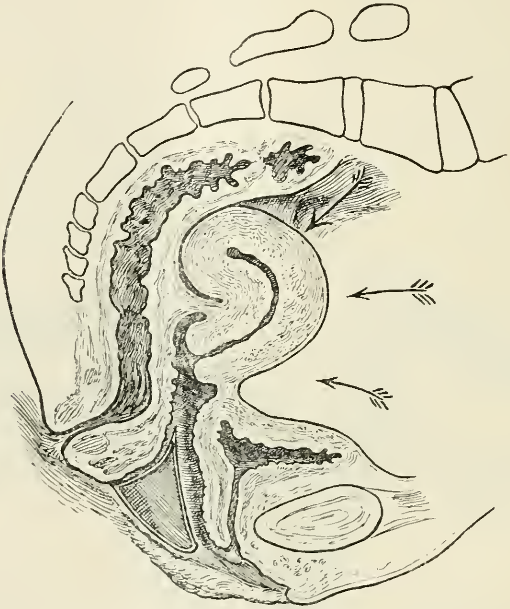


Fibrous suspension-cords attaching the posterior surface of the uterus to the anterior abdominal wall. The left sutures remain at the wall and the right at the uterus. Drawing from a specimen removed more than a year after the suspensory operation.

instances at intervals of from one to several years, when the uterus is seen to be connected with the anterior abdominal wall by one or two bands of adhesions.

The accompanying illustration of suspended uterus, with adhesions, shows one of these cases, with two long bands of connective tissue running up from the posterior surface of the uterus to the abdominal wall on either side. These bands are broader at the ends and drawn out thin in the middle. One of the silk suspension-sutures appears on one side just under the abdominal wall, while the other is in contact with the uterus ; both were encapsulated when the uterus was removed.

Fig. 13.

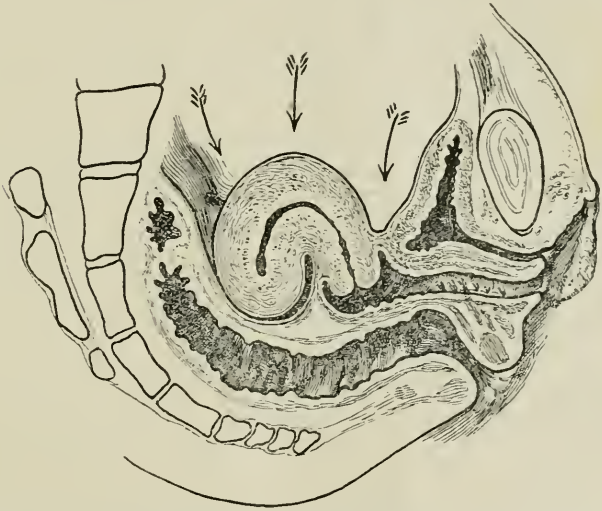


Relaxed vaginal outlet. The arrows represent the directions of the forces of intra-abdominal pressure constantly increasing the descensus. The triangular outline shows the effect of diminishing the size of the outlet by an operation. The picture must be viewed with the promontory vertically above the symphysis.

*Treatment of backward displacements by an operation upon the vaginal outlet and a suspensory operation combined.* In my operative cases of retrodisplacement the proportion between married and single women was about two to one, and most of the former were women who had borne children and in whom the displacement of the uterus was associated with a weakening of the pelvic floor and a gaping, relaxed vaginal orifice In such cases it is best, if possible, to correct both affections at one sitting by suspending the uterus in the manner described, followed by a reparative operation upon the outlet, restoring its normal calibre and lifting it up under the pubic arch, and giving the vagina again its normal direction at right-angles to the line of pressure of the intra-abdominal forces.

In recapitulating the various ways of treating retrodisplacement I mentioned under 4 an operation upon the vaginal outlet alone, and I did this to call attention to the fact that if it were necessary to elect, in any given case, between the vaginal and a suspensory operation, I should always prefer the lower vaginal operation, as by lifting up the vaginal outlet under the pubic arch the uterus is supported very much as it is held up by a pessary, and so the tendency to further displacement is checked, and although the displacement persists the patient is often entirely relieved of her distress. The performance of a suspensory operation alone, on the other hand, in a case in which the outlet is relaxed, will not prove beneficial, as the tendency of the cervix, and with it the body of the uterus, is always to drag down toward a relaxed outlet, and this descensus persisted in will in time rupture the suspensory adhesions of the most successful operation and so reproduce the retroflexion.

FIG. 14.



The restored outlet, sutures seen inside. The intra-abdominal pressure no longer tends to produce further displacement.

RECAPITULATION. The various operative methods cited for treating retroflexions resolve themselves into two classes: the direct methods, which attack the body of the uterus; and the indirect methods, which deal with the uterus mediately by the round ligaments, the broad ligaments, or the utero-sacral ligaments. Of the indirect methods, the two which promise the best results are that of Pryor, acting through the vagina on the cervical end of the uterus in order to produce enough scar-tissue about the utero-sacral ligaments to hold the cervix well back in the pelvis; and that of Pagenstecher, which endeavors to accomplish the same thing by suturing and shortening the round ligaments. The other indirect method is that of Alexander, acting upon the opposite pole of the uterus by means of the round ligaments. I think the best elaborated technique of this procedure is that of Dr. Edebohls, of New York.

The direct methods are two: the vaginal fixation, and the abdominal fixation or suspension. The vaginal operation has been practically abandoned, and the only abdominal operation which has thus far stood the test of prolonged trial in a number of cases is my own, which I have for this reason carefully described. The student interested in this subject should not fail to consult a carefully prepared digest by Dr. C. P. Noble, of Philadelphia, who has admirably presented the effects of suspension and ventrofixation upon pregnancy and labor. (See *American Journal of Obstetrics*, 1896, vol. xxxiv., No. 2.)

Almost all writers upon the subject of the operative treatment of retroflexions have been in the habit of discriminating between various classes of cases; for example, a distinction is made between those past the childbearing period and those still within it; and operations such as vaginofixation, which experience has shown ought not to be performed during the childbearing period on account of the danger to patient and child in case of pregnancy, may very properly be performed in a woman who is not likely to become pregnant.

A distinction generally recognized is between the adherent and mobile retroflexions. Some operators, while unwilling to open the peritoneum in the case of a non-adherent movable uterus, feel that sufficient justification for cœliotomy exists when there are posterior adhesions or disease of one or both adnexæ. Although this distinction was emphasized at the recent Gynecological Congress at Geneva, I have not dwelt upon it here, as I have shown by my own statistics that the danger to life from a properly performed suspensory operation is no greater than in any other so-called simpler operations. In addition to this the peritoneal incision always affords an opportunity of inspecting the appendages and discovering diseases often unsuspected, such as hydrosalpinx and adhesions of less grade; in one instance I found a commencing papilloma of the right ovary, not larger than a split-pea in size.

My conclusion in the whole matter would be that operative measures are only to be resorted to for the relief of retroflexion in those cases in which there is good reason to believe that the displacement seriously interferes with the patient's health and comfort. Then, if the case is one calling for operation in a woman who has borne children, first always look well to the vaginal outlet, and restore it, if it is broken down. The Alexander operation, as performed by Edebohls, will yield excellent results; my personal preference is to deal directly with the retroflexed body of the uterus by a suspensory operation.

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# THE ETIOLOGY AND CLASSIFICATION OF INFECTIOUS DISEASES.[1]

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The additions which have been made to our knowledge relating to the etiology of infectious diseases during the past thirty years are generally recognized as constituting a substantial basis for scientific medicine. We are not yet entirely released from the trammels of unsupported theories and traditions; but the sun of science is already approaching the horizon and gives light enough to enable us to perceive a broad and attractive landscape, a portion of which is still obscured by shadows which will no doubt soon be dissipated by the advancing source of light and life. Those of us who were graduated prior to the dawning of this new light are best able to appreciate the importance of the recent additions to our knowledge in this fundamental department of medicine. I confess that etiological studies have always had a special attraction for me; and it has seemed to me that a general review of the evidence relating to the etiology of the infectious diseases might not be out of place on the present occasion. The facts which I shall present will not, of course, have the charm of novelty, since those who constitute my audience are physicians who have no doubt kept pace with the progress of discovery in this field of investigation.

It is hardly necessary to say that by "infectious diseases" we mean those diseases which result from the introduction into the body of some disease-producing agent. And I think we are justified in saying that an essential condition of infection is that the disease-producing agent shall be capable of reproduction in the body of the infected individual—in other words, that it is a living organism. It matters not whether this living organism is large or small; whether it belongs to the animal or vegetable kingdom; whether it is located in the skin, as in scabies; in the muscles, as in trichinosis; in the lymphatics, as in erysipelas; in the solid viscera, as in amœbic abscess of the liver; in the intestine, as in cholera; or in the blood, as in relapsing fever: the introduction and multiplication of the living infectious agent constitute infection.

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[1] Westley Carpenter Lecture, delivered before the New York Academy of Medicine, November 5, 1896.

Having this definition in view, and in the light of recent additions to our knowledge, we now include among the infectious diseases many pathological conditions which a few years ago were not recognized as being due to infection; *e. g.*, tetanus, pneumonia, pleurisy, meningitis, etc. Indeed, the list of infectious diseases is constantly being increased, and an " idiopathic inflammation " of skin, mucous or serous membrane, or visceral parenchyma is something which modern pathologists find it more and more difficult to believe in. It is true that we may have inflammation and pus-formation independently of living organisms, but only as the result of the direct action of certain irritant chemical agents, and such inflammation is certainly not idiopathic. Thus we may have a dermatitis from the local action of the poison of Rhus toxicodendron; a gastritis may result from the introduction into the stomach of an irritant poison; a parenchymous nephritis may be due to toxic substances present in the blood circulating through the renal vessels, etc. Mechanical irritation alone does not give rise to suppurative inflammation; but it is a potent predisposing factor, inasmuch as bruised tissues are especially liable to infection. The stone in the bladder or the surgeon's instrument introduced for its removal does not cause a cystitis; but the bacteria to which this is due would be impotent in the absence of any mechanical injury to the mucous membrane. It is not very many years since the peritoneum, the synovial membranes of the joints, and other serous membranes were supposed to be especially liable to become inflamed as a result of laceration, exposure to the air, etc.; but the experience of surgeons at the present day shows that such membranes may be freely exposed and roughly handled without any bad result if infection is avoided by the employment of antiseptic or aseptic methods.

The tolerance of the peritoneum to mechanical irritation and the marked difference in the results of infection by the micro-organisms which cause peritonitis and of the introduction of finely pulverized glass into the peritoneal cavity are well illustrated by experiments which I made in 1884. In these experiments finely powdered, sterilized glass was introduced into the abdominal cavity of rabbits in amounts varying from four to eight grammes. In my report of these experiments I say:[1] " It was a matter of astonishment to me that such an amount of irritating material could be introduced into the peritoneal cavity of a delicate animal like the rabbit without producing fatal peritonitis." The inflammation which did occur was of a conservative kind, and resulted in the formation of nodules of various sizes, from the head of a pin up to that of a bean, which consisted of connective tissue enclosing the angular fragments of glass. There were also " adhesions composed of newly formed connective tissue rich in cells and containing numerous small masses of glass inclosed in a capsule." The rabbits subjected to these experiments remained in good health and increased in weight up to the time that they were killed, at the end of two or three months, for the purpose of observing the local effects of the foreign material introduced into the peritoneal cavity. The result is similar when sterilized foreign bodies are introduced into the connective tissue, the muscles, or the solid viscera : the conservative inflammation which occurs is entirely local, is not attended with the formation of pus, and results in enclosing the foreign body in a fibrous capsule. But if our foreign body carries with it a few pyogenic bacteria, a localized infectious process is established and we have the formation of an abscess ; or, if the pyogenic bacteria are of a virulent variety, they may invade the blood and give rise to fatal septicæmia.

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[1] THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES, 1885, N. S., clxxvii. p. 71.

In traumatic infection the pathogenic micro-organism may be from an external source or from the surface of the body or of a mucous membrane of the infected individual, as is no doubt usually the case when suppuration occurs in operative wounds, etc. Autoinfection is also, without doubt, the rule in croupous pneumonia, in pleurisy, in meningitis, etc., the infectious agent being habitually present in the salivary secretions or elsewhere, and the localization and multiplication of this being due to other factors which are just as essential in the etiology of these and other diseases as is the specific infectious agent.

One of the objects in view in the present address is to call attention to these other factors. In the first place, it is evident that the pathogenic germ is impotent to produce disease in the absence of a susceptible individual, and we know that susceptibility to infection varies in different individuals and in the same individual at different times and as a result of various circumstances. In general, depressing agencies, such as starvation, loss of blood, alcoholism, crowd-poisoning, etc., increase the predisposition to infection. It is for this reason that epidemics so often go hand-in-hand with famine, that the victims of chronic alcoholism are so subject to pneumonia, to carbuncle, and other localized infectious processes as well as to epidemic diseases ; that puerperal women who have lost much blood are especially liable to septic infection, etc. In addition to the predisposition due to natural susceptibility, increased or otherwise by depressing agencies, another factor is in many cases essential for the establishment of a localized centre of infection. This is a direct exciting cause, such as mechanical violence to the tissues, the action of a chemical irritant, or a localized congestion from any cause and often reflex in its origin. We believe that the last-mentioned condition is very frequently the determining cause of a pneumonia, a pleurisy, a tonsillitis, or a meningitis ; and also of a considerable proportion of the cases of diphtheria, influenza, Asiatic cholera, etc. It has been recently demonstrated that healthy persons may carry the bacillus of diphtheria in their throats for a considerable period without presenting any evidence of diphtheritic infection, and that during the prevalence of cholera the cholera-spirillum is not infrequently found in the alvine discharges of persons who present no symptoms of the disease. These facts are quite in accord with what had previously been shown with reference to other pathogenic bacteria. The present writer carried the micrococcus of croupous pneumonia in his salivary secretions for years, and Netter has since demonstrated its presence in the saliva of 15 per cent. of the healthy individuals examined by him. Streptococci and staphylococci, capable of producing abscess-formation, or even general septic infection, may be carried upon the surface of the body, or of a mucous membrane, with impunity so long as the susceptibility of the individual is not below the normal and there is no local point of diminished resistance through which infection may occur. In like manner, we believe, the influenza-bacillus may effect a lodgement in the respiratory passages of healthy persons and remain for a longer or shorter time without producing an attack of the disease, which is liable to be developed, as in the case of pneumonia, tonsillitis, etc., as a result of exposure to cold—" catching cold." In Asiatic cholera the exciting cause of an attack, when the cholera-spirillum is present in the intestine, may be exposure to cold, or more frequently a congestion of the mucous membrane due to undigested and irritating material in the primæ viæ. In the popular mind, in the absence of any exact knowledge of the specific infectious agent, the attack is usually ascribed to the exciting cause, and among physicians this was formerly considered a satisfactory explanation of the etiology of the diseases referred to. This view was supported by tables of seasonal prevalence, showing that pneumonia and influenza occur most frequently in the winter and spring, diarrhœal diseases in the summer, etc. In the light of our present knowledge it is evident that the exciting cause of an infectious disease is an etiological factor which would be inoperative in the absence of a specific infectious agent; but, on the other hand, the specific infectious agent is often impotent for evil in the absence of a direct exciting cause, and both will fail to produce disease in the absence of a natural or acquired predisposition or susceptibility. To illustrate: a tendency to tubercular infection is inherited by certain individuals; these individuals live in a locality where tubercle-bacilli abound in the dust of their dwellings, in milk consumed as food, etc. In such individuals an injury to the knee or to the hip during youth is likely to give rise to tuberculous joint-affection. At the age of twenty to thirty years the tendency to pulmonary infection is more marked, and the predisposition is increased by any depressing agency, such as poor food, insanitary surroundings, a sedentary life, mental anxiety, etc. As a direct exciting cause we may have the pulmonary congestion which results from taking cold (reflex), the irritant action of dust-particles or chemical vapors (as in certain manufacturing industries), or the devitalizing influence of other infectious processes (croupous pneumonia, bronchitis, etc.). In the case of Asiatic cholera predisposition probably also constitutes an important factor. Among individuals who are exposed under apparently identical conditions a certain number may suffer a fatal attack, others may have a slight choleraic diarrhœa, while others may escape entirely. It is difficult to determine, however, that in such a case the conditions favoring infection were identical; there may have been a difference in the reaction of the gastric juice; or a temporary indigestion, exposure to cold during the night, fatigue, or fear may have acted independently or in association as exciting causes and be directly responsible for the development of the attack. In diphtheria, again, we have a difference in susceptibility; the young, as a rule, having a greater predisposition to the disease than adults, and certain families appearing to be especially liable to it. This predisposition is probably intensified by any acute or chronic inflammation of the mucous membranes most exposed to infection; or, when the diphtheria-bacillus has effected a lodgement upon the healthy mucous membrane, a reflex hyperæmia due to exposure—"catching cold"—may be the exciting cause of the attack.

The seasonal prevalence of certain diseases is due to the fact that the specific infectious agent multiplies external to the bodies of infected individuals when conditions as to temperature, moisture, and organic pabulum are favorable for such multiplication. The epidemic prevalence of yellow-fever, of cholera, and of various forms of intestinal flux during the summer-months and the autumnal epidemic of malarial fevers in regions favorable for the development of the malarial parasite are no doubt to be accounted for in this way. On the other hand, certain diseases, in which there is no evidence that the specific infectious agent is capable of multiplication outside of the bodies of infected individuals, are most prevalent in winter because conditions are then more favorable for their communication from individual to individual. This is true of those infectious diseases which are communicated by personal contact ("contagious diseases"), such as smallpox, measles, scarlet fever, whooping-cough, influenza, diphtheria, etc. Evidently conditions which bring those already infected in close personal contact with healthy individuals, at a time when doors and windows are closed to exclude the cold air, will favor the extension of these diseases. In cities a notable increase in the prevalence of diphtheria and scarlet fever has been observed when the public schools were opened in the autumn. The increased prevalence of influenza and diphtheria during the winter and spring is due not only to the influence of exposure to cold as a factor in developing an attack, but also to the intimate association of those already infected with healthy individuals. This occurs in schools, churches, factories, and private dwellings, and fully accounts for the rapid epidemic extension of influenza in towns and cities. It is somewhat remarkable that the extension of this disease from individual to individual, by personal contact, is not recognized by the public generally and is still denied by a considerable number of physicians. As a matter of fact, the specific infectious agent has been known since 1892, when it was discovered by Pfeiffer in the purulent bronchial secretions of influenza-patients, in which it is found in vast numbers. This secretion is just as much infectious material as is the false membrane of diphtheria or the contents of smallpox-pustules—each being able to reproduce its kind when introduced into the body of a susceptible individual. And if an influenza-epidemic is developed more quickly than an epidemic of diphtheria or of smallpox, this is chiefly due to the fact that the period of incubation is short and that no quarantine-precautions are taken. The influenza-patient receives his friends while confined to his room, with an unconscious disregard of the fact that he is exposing them to an attack of the infectious disease from which he is suffering; and when able to go out he or she may be seen at theatres, teas, balls, dinners, and public gatherings of all kinds, naïvely announcing to friends that he is just recovering from a severe attack of the grippe, and from time to time coughing up a little bronchial mucus loaded with influenza-bacilli.

It is not many years since a majority of the profession accepted the popular view that during epidemics the atmosphere becomes widely contaminated with the infectious element, and that infection usually results from the respiration of air contaminated in this way; also that such infected air might be wafted across continents or oceans without losing its infecting-power. So recently as the meeting of the International Sanitary Conference at Rome, in 1885, this view was maintained by two of the English delegates as regards cholera—which, they contended, extends from its epidemic foci in India through the atmosphere quite independently of human intercourse or means of transportation. It is hardly necessary to call attention to the fact that it has now been repeatedly demonstrated by exact researches that the cholera-spirillum is quickly destroyed by desiccation and exposure to sunlight, and that the idea of a cholera-infected atmosphere can no longer be entertained. We know from experience that even so persistent a poison as that of smallpox is not transmitted through the air in an effective condition to any considerable distance from an apartment containing smallpox-patients. By desiccation, the germicidal action of sunlight, and dilution, all known pathogenic bacteria quickly lose their infecting-power, and it is surprising that any well-informed physician should entertain the vague and unscientific notions with reference to the epidemic prevalence of influenza which formerly passed current in attempts to explain epidemics of cholera, typhoid fever, typhus, etc. But while this is true as regards the diseases heretofore referred to, all of which have been proved to be of bacterial origin, it appears to be well established that the malarial parasite, which finds its favorable habitat in marshy localities, may be carried by currents of air to a considerable distance and may gain access to the blood by way of the respiratory passages. At least this mode of infection appears to be the only way of accounting for numerous facts which have been observed. But in this case the facts are consistent with the theory : the cases of malarial fever occur in the greatest number in proximity to the marshy lands which give origin to the poison ; they are more numerous on the edge of a town nearest to the malarial swamp and in a line with the prevailing winds. When the same theory is applied to cholera or influenza we shall find that it receives no support from facts or from physical laws. The epidemic extension may occur in a direction opposite to the prevailing winds and is evidently independent of atmospheric currents. Moreover, in the absence of a constant supply of the infectious elements, from a source external to the human body, such as we have in the malarial marshes, the effect of the atmospheric currents would be to dissipate the poison, and the "contaminated air" of to-day would to-morrow be far away from the epidemic-stricken region. The continuance of an epidemic is therefore an insuperable objection to the theory that the disease is propagated through the respiration of an infected atmosphere.

The facts which have been developed with reference to the transmission of cholera and typhoid fever, considered in connection with numerous recorded observations relating to the supposed development of malarial fevers as a result of drinking surface-waters, have led some authors to the conclusion that malarial infection, also, commonly results from the introduction of the malarial parasite in this way. Without denying that this may occur, I am disposed to believe that much of the evidence which has been advanced in favor of this view is unreliable. In many cases the so-called malarial fevers which have been traced to the use of surface-water from wells, streams, etc., have been of a "continued type" and not controlled by quinine. In the absence of positive evidence of the presence of the malarial parasite in the blood, continued or remittent fevers which resist the specific action of quinine cannot, in our opinion, be properly classed with the malarial fevers. If not due to infection by the typhoid-bacillus, they are, at least, more nearly allied to typhoid than to the typical malarial fevers. Parkes and other authors have quoted the account given by Boudin, relating to an epidemic which occurred among troops on the transport-ship "Argo," in 1834, and have accepted this as an instance in which malarial fevers were proved to be due to the use of impure marsh-water. But Boudin himself admits that the evidence was not conclusive. He says : "Le fait suivant, dont

nous avons été témoin au lazaret de Marseille, en 1834, pourra paraître concluant au premier abord, et pourtant, en y regardant de près, on est contraint de rester dans le doute."

If Boudin, who was a member of the board of medical officers charged with an investigation, made at the time, for the purpose of determining the etiology of this epidemic, remained in doubt as to the influence of the impure marsh-water which had been taken on board the transport at the port of departure, we are surely justified in not attaching so much importance to this instance as some authors have been disposed to do. Moreover, we would call attention to the fact that this was an epidemic of a malignant and fatal form of fever, thirteen soldiers having died during the short voyage from Bona to Marseilles. If the epidemic was in fact due to the impure marsh-water, the question arises as to the true nature of the disease. If malarial fevers, properly so-called, and of such a malignant type, can be contracted as the result of drinking impure marsh-water, we should expect to have ample evidence of the fact, and the case of the "Argo" would hardly remain as a solitary instance of such an outbreak on shipboard.

In this connection I beg leave to quote as follows from my work on *Malaria and Malarial Diseases*, published in 1884:

> "It is well established that enteric fever and certain alvine fluxes may result from the use of contaminated drinking-water. And in the case of the former disease we know that even very great dilution does not destroy the infectious properties of the contaminated water; *e. g.*, in those cases in which it has been used to wash vessels in which milk was placed, and in which typhoid fever has resulted from drinking this.
>
> "That fevers having an intermittent or remittent character may also be produced in the same way cannot be doubted. But we have already seen, in the introduction to the present volume, that enteric fever frequently presents these characters; that in this case the differential diagnosis from malarial fevers presents great difficulties, and that in many parts of the world fevers of this character are attributed, without question, to malaria. We therefore feel inclined to accept the evidence with a great deal of caution. Moreover, we think that considerable weight should be accorded to the negative evidence. It would seem that if this mode of infection occurs at all, it should occur frequently, and in that case that it would be more generally recognized. From what has been said in the introduction, it will be seen that we cannot accept evidence relating to the production of malarial diarrhœa, or malarial dysentery, or mountain-fever, or continued remittent fever, or typho-malarial fever in any of its forms.
>
> "If malarial diseases are produced at all by the ingestion of 'malarious waters,' we have reason to expect that typical intermittents will be so produced. And as there may be some question as to the etiology of continued or pernicious remittents, we are justified in demanding that these be excluded in the consideration of this question.
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> "Dr. Parkes was the strongest advocate of the view that malarial fevers may result in the way indicated. His opinion is entitled to the

greatest consideration. But we would remark that the facts adduced in support of this opinion did not come under his personal observation and are in great part drawn from the reports of English physicians practising in India, where, as he himself says: 'At the present time in India the opinion seems to be gaining ground that the prevalent notions about malaria require to be reconsidered; that " malaria " is much less common than is supposed, and that the mixing up of relapsing fever, typhoid fever, and perhaps other specific fevers with malarious diseases has caused so much confusion that all old observations should be thrown aside.'

" Much of the evidence presented by Parkes in his *Practical Hygiene* is so vague as to the nature of the fever produced by drinking surface-water that we can accord it but little weight.

" Professor Colin, of Val de Grace, who is so well known for his researches on intermittent fever, is inclined to question the production of paroxysmal fevers by marsh-water. He cites numerous cases in Algiers and Italy where impure marsh-water gave rise to indigestion, diarrhœa, and dysentery, but in no case to intermittent fever, and in all his observations he had never met with an instance of such an origin of ague."

In cholera and typhoid fever the mode of propagation is no longer a mystery. The researches of bacteriologists have demonstrated the biological characters of the pathogenic bacteria which are concerned in the etiology of those diseases, and the fact that they are found in the alvine discharges of the sick. The channel of infection is now generally recognized by physicians and by sanitarians, and it is unnecessary to attempt at the present time to support by evidence the statement that infection usually occurs from the use of water or food contaminated by the specific germs of the diseases in question. But there is another epidemic disease which has many points in common with these two, in which there is no evidence that infection occurs in the same way, and in which apparently it does occur through the respiration of an infected atmosphere. The disease referred to is yellow fever. Even more decidedly than in the case of cholera and typhoid fever, the epidemic prevalence of this disease depends upon insanitary local conditions and an elevated temperature, such as is most favorable for the rapid development of micro-organisms. Unfortunately, all researches made for the purpose of discovering the deadly germ of this pestilential disease have hitherto been unavailing. The writer has been led to believe that, as in cholera and in typhoid fever, the germ is present in the alimentary canal of infected individuals; and that when material containing it is thrown out in localities where the proper pabulum exists for its development, under favorable conditions as to temperature and moisture, it multiplies abundantly, establishing rapidly extending foci of infection. Susceptible persons visiting such localities contract yellow fever, and there is no satisfactory evidence on record showing that infection occurs from the ingestion of water or food contaminated with infectious material.

The inference, therefore, appears to be justified that the disease is contracted by respiring an infected atmosphere. But this inference may eventually turn out to be a mistaken one, although many facts could be given which seem to support it. It will be observed that in this case the supposed infection of the atmosphere is of limited extent and depends upon a continuous supply of the infectious elements from the telluric foci from which these are believed to be given off. The mode of infection, therefore, would correspond with that which occurs in the malarial fevers when these are contracted by breathing the air from marshy places, and would give no support to the idea that the epidemic prevalence of such diseases as cholera, influenza, etc., may be due to a general contamination of the atmosphere of a town or of a section of country; or that there is any substantial basis for the " pandemic wave-theory " which was advanced by some of the older writers upon epidemiology. There is a way by which pathogenic bacteria may be carried a limited distance through the air, and by which infectious material may be conveyed from house to house, from a privy-vault to the beefsteak upon the kitchen-table or into the milk-jug, which should not be lost sight of in considering channels of infection. This is upon the feet of insects, and especially of house-flies, which, as is well known, frequent all kinds of decomposing animal material and swarm upon the surface of fecal matter deposited upon the surface of the ground or in shallow pits. There are many facts which support the view that such material affords a suitable nidus for the development of the yellow-fever germ, and I am strongly inclined to believe that the ubiquitous house-fly is a factor of considerable importance in the propagation of yellow fever, typhoid fever, and cholera.

Dr. Finlay, of Havana, some years ago conceived the idea that yellow fever is transmitted from the sick to susceptible individuals by mosquitoes; but his experiments do not give any support to his theory. He finds that the female mosquito after filling itself with blood from a yellow-fever patient will not again draw blood for about forty-eight hours, but that at the expiration of this time it will again fill itself if applied to another individual. Dr. Finlay reports that he " inoculated " eighty-seven persons by means of mosquitoes between June 30, 1881, and December 2, 1893. "All were white adults, uniting the conditions which justify the assumption that they were susceptible to yellow fever." Within a term of days, varying between five and twenty-five after the inoculation, one presented a mild albuminuric attack, and thirteen only " acclimation-fevers." Inasmuch as seventy-three out of the eighty-seven individuals to whom the " contaminated mosquitoes " were applied presented no symptoms which could be ascribed to the so-called " inoculation," and as the one who presented " a mild albuminuric attack " and the thirteen who had " acclimation-fevers " within twenty-five days after the application of the mosquitoes were exposed in Havana to the climatic conditions which give rise to such fevers in other susceptible individuals, I think we are justified in the statement that Dr. Finlay's experiments give no support to his theory.

It has also been suggested that the mosquito may give rise to malarial infection, by introducing the malarial germ through the puncture it makes for the purpose of obtaining the blood of its victim. But I know of no exact observations or experimental evidence in support of this hypothesis. There are, however, some reasons for believing that the mosquito may play a part in the etiology of malaria in the way suggested by Manson—*i. e.*, as the agent by which the parasite is withdrawn from the blood of infected individuals and returned to its normal habitat outside of the body to complete its life-history. We have an analogy for this in the part played by the mosquito in withdrawing embryo filariæ from the blood and returning them to the stagnant pools frequented by the insect. Manson says, in discussing this hypothesis in his Gulstonian Lectures (1896):

> "We can readily understand how the mosquito-bred plasmodium may be swallowed by man in water, as so many disease-germs are, and we can readily understand how it may be inhaled in dust. Mosquito-haunted pools dry up. The plasmodia in the larvæ and those that have been scattered about in the water, finding themselves stranded by the drought, and so placed in a condition unfavorable for development, pass into a resting-stage, just as they do when by quinine or other means man is rendered temporarily unsuited for their active life. They may—probably do—become encysted, as so many of the protozoa do in similar circumstances. The dried sediment of the pool, blown about by winds and currents of air, is inhaled by man, and so the plasmodium may find its way back again to the host from whom its ancestors had, perhaps, started generations back."

This theory appears plausible; but we find it difficult to believe that man is essential for the completion of the life-cycle of the plasmodium, for the most concentrated and deadly malarial emanations may be given off from marshy places which are far removed from the haunts of man. It may be, however, that the mosquito is an essential factor in the development of the plasmodium, and that man, instead of being a necessary intermediate host, only serves occasionally and in a certain sense accidentally as such. Perhaps other mammals or birds may serve the same purpose. It has frequently occurred to the writer that the malarial plasmodium, like other amœboid protozoa, may find its normal habitat, external to the bodies of its insect or animal hosts, upon the stems and leaves of water-plants, rather than in the water itself. The fact that malarial fevers do not prevail in the vicinity of swamps when the marsh vegetation is submerged by high water is in favor of this view; as is also its apparent need of plenty of oxygen, which we infer from its active multiplication in the blood and its parasitic invasion of the red blood-corpuscles.

The transmission of infectious diseases by insects appears to be well established in the case of Texas fever of cattle and of the fatal African epizootic known as the "fly-disease." In the first-mentioned disease, which has been shown by Theobald Smith to be due to a minute blood-parasite which invades the red corpuscles, the tick is the intermediate host. The ticks which fall from infected animals give birth to a numerous progeny in the pastures frequented by them, and these young ticks attach themselves to other animals which subsequently feed in the same pastures and transmit to them the fatal infection.

The African fly-disease is fatal to the ox, the horse, the dog, the sheep, and the ass, but not to the indigenous wild animals in the region infested by the tsetse-fly. The recent researches of Bruce indicate that the fly acts as a carrier of the infectious agent from diseased to healthy animals. In the blood of infected animals Bruce finds a flagellated micro-organism similar to the protozoon, which is recognized as the cause of the so-called "surra disease" of India—Trypanosma evansi. After feeding on the blood of an infected animal the tsetse-fly can communicate the disease to a healthy animal by its bite. After a short period of incubation the hæmatozoa appear in the blood concurrently with the development of fever, followed by rapidly progressive anæmia, dropsy, etc. That anthrax, streptococcus-infection, etc., may be transmitted by flies which have been in contact with infectious material and subsequently alight upon an open wound, sometimes of the most trifling character, appears to be well established.

The essential factors in the etiology of an infectious disease, as already indicated, are a susceptible individual and a specific infectious agent capable of reproduction in the body of such individual. Both of these factors are subject to very considerable variation ; individuals in degree of susceptibility, and the specific infectious agent in pathogenic potency. And it is evident that when one factor is diminished the other must be increased to produce a positive result. Thus infection may occur as the result of the introduction into the body of a very susceptible individual of a micro-organism the pathogenic potency of which is greatly attenuated ; or an individual with but little susceptibility may succumb to an infection resulting from the introduction of a virulent variety of the same micro-organism. The experiments of bacteriologists show that the known pathogenic bacteria vary greatly in pathogenic potency when obtained directly from the blood or tissues of infected individuals, and that a still greater difference occurs when they lead a saprophytic existence, either in artificial culture-media or under conditions found in nature. Also that, in many instances at least, infection depends not only upon the pathogenic potency of the germ, but upon the introduction into a susceptible individual of a certain number, the quantity required bearing an inverse ratio to the pathogenic virulence. These facts have thrown a flood of light upon epidemiology and upon clinical medicine. We now recognize the fact that where the susceptibility to infection is slight, or the specific infectious agent more or less attenuated, we may have a mild attack which fails to present all of the characteristic symptoms of a typical severe attack as described in text-books of medicine. Thus we may have sore-throats which are true diphtheria, although the characteristic false membrane is absent; we may have typhoid infection without diarrhœa or delirium, or rose-spots upon the abdomen; we may have malarial infection without the characteristic periodic paroxysms of fever; we may have yellow fever without albuminous urine, or black vomit, or a yellow skin. In short, we can no longer permit our diagnosis to rest solely upon a clinical picture drawn from the severe and fatal cases of an infectious disease. As a matter of fact, this clinical picture not infrequently includes something more than the symptoms due to the specific infectious process to which we give the name diphtheria, or pulmonary tuberculosis, or scarlet fever, etc. The most prominent and fatal symptoms may be due to a secondary infection by a different pathogenic micro-organism. The so-called "practical physician," who rejects the aid of the bacteriologist and insists that the diagnosis must rest upon the clinical features of a case, is not only at a disadvantage in the early diagnosis of his cases of certain infectious diseases and in the recognition of the specific character of mild and atypical attacks, but he is liable to the mistaken assumption that symptoms observed are essential features of a disease when they are in reality due to a secondary infection.

My discussion of the classification of infectious diseases is undertaken without any expectation of offering at the present time a satisfactory scientific classification, but rather as showing the difficulties attending such an attempt in the present state of knowledge. That a scientific classification of diseases should be based upon etiology is generally admitted, and we have to-day a great advantage over our predecessors as regards the data for such a classification. Still our knowledge is incomplete in many directions, and we are yet in doubt as to whether certain diseases should be included among the infectious diseases or not. The tendency of modern science has been, however, to add constantly to the list of diseases of this class. It is less than fifteen years since Koch published his discovery of the tubercle-bacillus; the tetanus-bacillus was discovered in 1884; the bacillus of influenza in 1892. To-day we are discussing the propriety of transferring acute rheumatism to the list of infectious diseases. To-morrow we may be able to include cancer in all its varieties.

As illustrating the rapid development of our knowledge and the consequent additions to the list of infectious diseases, I venture to quote from the recent important work of Unna, on *The Histopathology of Diseases of the Skin:*

> "The infectious inflammations of the skin form a comprehensive group, not only the richest in types of all groups, but also the one which, by the discovery of new infectious agents and the recognition of the infectious nature of diseases previously considered not infectious, is from day to day steadily increasing in extent. It falls naturally into two divisions—that of the acute exanthems, in which the exanthem is only one symptom of the acute general disease, and that of the local cutaneous infections.
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> "Before considering the individual members of this great group, it must be stated that in any arrangement only the clinical and histological facts can be utilized, for of the etiology, the active infective cause, our knowledge is too deficient and in particular too unequal. Only of a few of these infections can it be said that our etiological knowledge is as complete as our anatomical and clinical, as, for example, in tuberculosis, impetigo staphylogenes, trichophytosis, scabies, erysipelas. In other certainly not less infectious processes—*e.g.*, syphilis, Aleppo boil, impetigo contagiosa—we have scarcely or not at all the first rudiments of etiological knowledge. In others we have noteworthy commencements of a better knowledge; but they still require confirmation from other investigators, as in eczema, psoriasis, erysipeloid, acne varioliformis, ecthyma, ulcus molle. Other processes are so nearly comparable to better known infectious skin diseases that, without etiological recognition, their provisional installation is justified—*e. g.*, tinea imbricata, impetigo herpetiformis, parakeratosis scutularis, lichen planus, pemphigus acutus benignus, folliculitis (Lukasiewicz), spiradenitis, the so-called pemphigus vegetans, etc. Finally there are some of which the etiology appears to be already determined by certain investigators, but is generally contradicted, as in the psorospermosis of Darier and in vaccinia.
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> "It will therefore not appear strange if, supported by purely anatomical and clinical grounds, we rank here a series of skin diseases whose infectivity is as yet partly not suspected, partly denied, and as yet not certainly determined, in the sure hope that the future will establish their position, as it has done for so many other affections in the last ten years. As such, for example, I regard pityriasis rubra (Hebra), pityriasis rubra pilaris, pemphigus chronicus, acne, and ichthyosis. The justification of this will appear partly from their histological peculiarities, as these are described, and partly from the clinical relations, which here are only suggested."

It must be remembered that an infectious skin disease is not necessarily contagious, because in many cases the infectious process depends upon individual predisposition and local exciting causes, which are essential factors in the development of disease.

If we turn from diseases of the skin to acute and chronic inflammations of mucous membranes, we shall find that when these are not due to the direct action of chemical irritants they are almost certainly the result of a localized infection. This is probably true of chronic conjunctivitis in all its forms, of chronic nasal catarrh, pharyngitis, laryngitis, bronchitis, enteritis, endometritis, cystitis, etc. We may have a temporary congestion of a mucous membrane as a reflex phenomenon due to exposure to cold, or as the direct result of the action of a chemical or mechanical irritant; but when an acute or chronic suppurative inflammation follows, it is probably due to the presence of pathogenic micro-organisms of one kind or another. A grain of sand in the eye will quickly give rise to hyperæmia of the conjunctiva, which soon subsides when the mechanical irritant is removed. If it is not removed, a conjunctivitis may be developed as a result of the presence of pyogenic micrococci. We have, in fact, a traumatic infection. The same thing occurs in cystitis, except that in this case the infecting micro-organisms must be introduced from without, as they are not habitually present in the healthy bladder. The traumatism and the introduction of the pathogenic bacteria to which the cystitis is due no doubt result, in a large proportion of the cases, from the introduction of instruments into the bladder for purposes of exploration, etc. Endometritis, following a miscarriage or an operative procedure of any kind, and puerperal infection may also be regarded as traumatic infections.

Unna says in the recent work from which we have already quoted: "The more we have learned of the infectious agents in all inflammations of external wounds, the more has the number of simple traumatic inflammations decreased. Possibly the intertriginous inflammations, the ingrowing nail, are only circulatory disturbances until some external infection makes the process inflammatory." We think this is not only possible but extremely probable, and in the near future it is likely to become a settled conviction based upon experimental evidence.

This brings us to speak of a classification based upon the mode or channel of infection. From this point of view we may have: (*a*) Traumatic infections; (*b*) infection by contact (direct contagion); (*c*) infection through ingesta; (*d*) infection through the respiratory tract. Under the heading "infection by contact" (*b*) we would have to include venereal diseases and contagious skin diseases. To what extent the eruptive fevers are contagious in this sense it is difficult to say. To transmit smallpox or vaccinia by way of the skin a traumatism is considered necessary—vaccination or inoculation; and it is probable that infection in the eruptive fevers usually occurs through the deposit of infectious material suspended in the air upon the respiratory mucous membrane, rather than through the unbroken skin. Scarlet fever and measles may also be transmitted by inoculation, and there is ample evidence that the first-mentioned disease may be transmitted through ingesta, especially milk. Typhoid fever, cholera, amœbic dysentery, cholera infantum, trichinosis, etc., are contracted by the introduction into the alimentary tract of ingesta containing the infectious elements to which they are due. Diphtheria, epidemic influenza, mumps, whooping-cough, measles, and pulmonary tuberculosis are probably contracted through the deposit upon the respiratory mucous membrane of the specific infectious elements to which they are due. Pneumonia, pleurisy, peritonitis, meningitis, bronchitis, and suppurative traumatic infections generally are due to micro-organisms which habitually lead a saprophytic existence upon the surface of the body or upon exposed mucous membranes; they are therefore commonly due to autoinfection.

Another method of classification which presents certain advantages is one based upon the nature of the infectious agent. This would give us the following principal groups:

I. Diseases due to infection by vegetable parasites: (*a*) Schizomycetes (bacteria); (*b*) hyphomycetes (microscopic fungi); (*c*) blastomycetes (yeasts).

II. Diseases due to infection by animal parasites: (*a*) Protozoa; (*b*) nematodes; (*c*) trematodes; (*d*) cestodes; (*e*) acari.[1]

Since the discovery of the tubercle-bacillus and the introduction of Koch's methods for the isolation and cultivation of bacteria by means of solid culture-media, the progress of our knowledge relating to the bacteria (Group I., *a*) has been very rapid, and while we have still, no doubt, much to learn about pathogenic bacteria, it is probable that few if any first-class discoveries in the etiology of infectious diseases remain for the bacteriologists. The infectious diseases due to micro-organisms of this class may be classified as follows: (*a*) General blood-infections, including relapsing fever, anthrax, septicæmia of cattle (Rinderseuche), etc.; (*b*) localized infections, acute or chronic, including erysipelas, diphtheria, influenza, croupous pneumonia, bronchitis(?), gonorrhœa, cystitis, pyelonephritis, endometritis, conjunctivitis, otitis, ozæna, pleurisy, peritonitis, pericarditis, meningitis, endocarditis, abscesses, furuncles, adenitis, mastitis, osteomyelitis, enteritis(?), Asiatic cholera, cholera nostras, cholera infantum, non-amœbic dysentery(?), typhoid fever, tuberculosis, glanders, rhinoscleroma, bubonic plague, chancroid, tetanus, malignant œdema, etc.

The second group (*b*) of infectious diseases due to vegetable parasites includes: Actinomycosis, mycetoma or Madura foot, the various forms of tinea (trichophyton, imbricata, versicolor, favosa), erythrasma, pinta (the spotted skin-disease of Mexico), etc.

Recent researches indicate that the blastomycetes (*c*) may, perhaps, play a more important *rôle* in animal pathology than has been heretofore suspected. Busse, in 1895, obtained from a case of chronic pyæmia a yeast which proved to be pathogenic for mice, and during the past two years several investigators (Sanfelice, Kehane, Curtis, Corselli and Frisco, Pianese, Roncali) have obtained pathogenic blastomycetes, by cultivation, from malignant tumors. Oïdium albicans, which is recognized as the usual cause of aphthous ulcers in the mouth, belongs to this group.

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[1] In this classification we do not take into account the animal parasites which infest the hair and the surface of the body (pediculi), or the ticks, "harvest-bugs" (Leptus autumnalis), and "jiggers" (Pulex penetrans), which bury themselves in the skin either completely or partially.

In the second group (II.), which includes infectious diseases due to animal parasites, especial interest attaches to the subgroup *a*—protozoa. The diseases which have been shown with a great degree of probability to belong to this group are the malarial fevers, amœbic dysentery, the surra cattle-disease of India, the tsetse "fly-disease" of Africa, and the "Texas fever" of American cattle. But these, I anticipate, are only the first discoveries in a very promising but difficult field of investigation. The presence of a ciliated amœboid micro-organism in the mucous secretion coughed up by children suffering from whooping-cough has recently been reported by Deichler (1886) and by Kourlow (1886).

The rapid progress of our knowledge of the bacteria has been due to the fact that satisfactory methods (staining) have been devised for detecting these minute micro-organisms in the blood and tissues of infected individuals and for cultivating them in artificial media. Unfortunately, these methods have only a limited utility when applied to investigations relating to the protozoa. The bacterial cell has considerable stability, owing to its cellulose envelope (cell-wall), and it is readily stained by the aniline-dyes. The protozoa, on the contrary, very readily undergo disintegration, and the more fluid protoplasm of these unicellular organisms is not so easy to demonstrate by the usual staining-reagents. It has also been found very difficult, and in many cases quite impossible, to obtain pure cultures in artificial media. Again, the recognition of protozoa in the blood of infected animals by means of the microscope requires special skill in making preparations, in the management of the light, etc., and expert knowledge of the normal elements of the blood and of the changes they undergo as a result of various methods of preparation. This is illustrated by the fact that many persons more or less familiar with the use of the microscope have failed to discover the malarial parasite in blood which undoubtedly contained it, while others have evidently mistaken vacuoles in normal blood-corpuscles for the plasmodium, the crenated red corpuscles for pigmented cells, and deformed corpuscles for malarial crescents.

Notwithstanding the painstaking researches which have been made during the past few years for the purpose of determining the nature of certain bodies which may be demonstrated by special staining-methods in the cells of carcinomatous tumors, we are still uncertain as to the nature and etiological import of these bodies. Some investigators believe them to be protozoa, and from their location infer that they are the specific etiological agents in the development of malignant growths of this character. But, so far as we are informed, this view has not as yet received any very substantial support, and has not been accepted by the leading pathologists of the world.

The presence of amœboid micro-organisms in the contents of the pustules of variola and in vaccine-lymph has been reported by several investigators—Guarnieri (1892), Monti (1894), Piana and Galli-Valerio (1894), L. Pfeiffer (1894), Clarke (1895), v. Sicherer (1895), E. Pfeiffer (1895). Guarnieri, in 1892, published a paper in which he claimed to have cultivated the amœboid micro-organism found by him in vaccine-lymph by successive inoculations in the corneæ of rabbits. E. Pfeiffer has since (1895) confirmed this observation, and has seen the parasite undergoing amœboid movements and in process of multiplication by spontaneous fission. During the past two years investigations relating to the etiology of vaccinia and variola have been made at the Army Medical Museum in Washington, by Major Walter Reed, Surgeon, U. S. A. These investigations show that in vaccinated monkeys and in children an amœboid parasite makes its appearance in the blood on the sixth or seventh day after vaccination, and may be found during a period of from five to seven days, when it disappears. Reed has found the same parasite in the blood of patients with variola and in his own blood after an accidental vaccination in the finger. The parasites are not numerous. They are less than a third the diameter of a red blood-corpuscle, and may be observed to undergo amœboid movements in a drop of blood, properly mounted for microscopical examination, during a period of twenty-four hours or more. These amœboid bodies, like the malarial parasite, would be easily overlooked by one not an expert in blood-examinations. This is the first public announcement of the results of Dr. Reed's extended and interesting observations, full details of which will be given by himself in a paper to be published hereafter.

Finally, we may base our classification upon the special tissues or organs involved in the infectious process. From this point of view we have :

I. General blood-infections (septicæmia), including malarial infection, relapsing fever, streptococcus-infection, etc., in man ; and anthrax, swine-plague, cattle-plague (Rinderpest), Texas fever of cattle, etc., in the domestic animals.

II. Localized infections : (*a*) Of the integument and subcutaneous connective tissue, including scabies, the dermatophyti, erysipelas, furuncles, etc. ; (*b*) of mucous membranes, including diphtheria, influenza, glanders, bronchitis, rhinitis, conjunctivitis, otitis, gonorrhœa, cystitis, enteritis(?), cholera Asiatica, cholera nostras, etc. ; (*c*) of serous membranes, including pleuritis, pericarditis, peritonitis, meningitis, and synovitis ; (*d*) of glands, including typhoid fever, bubonic plague, parotitis, mastitis, adenitis, etc.; (*e*) of the lungs, including pulmonary tuberculosis, croupous pneumonia, etc.

It is evident that under several of the subdivisions the diseases mentioned would require a subheading to designate definitely the nature of the infectious process. Thus we would have, for example, to specify whether a peritonitis was tubercular or due to streptococcus-infection or to some other known micro-organism; an adenitis might be due to syphilitic or tubercular infection or to one of the pus-cocci; a conjunctivitis to gonococcus-infection or to some other pathogenic micro-organism, etc.

It will be noted that, both in our classification based upon the nature of the infectious agent and in that based upon the special tissues or organs involved in the infectious process, we have not included the eruptive fevers. It is hardly necessary to say that this omission is due to the fact that we have as yet no positive knowledge to guide us in placing these infectious diseases in the systems of classification suggested, which are, therefore, necessarily incomplete.

# AN OPERATION FOR VALVULAR STRICTURE OF THE URETER.

By Christian Fenger, M.D.,
OF CHICAGO.

In cases of hydronephrosis or pyelitis with distention (pyonephrosis) it is not uncommon to find comparatively narrow or thin-walled, semilunar valves located transversely in the ureter. These open upward and have the same mechanical action as the valves in veins, and stop the passage of liquid through the ureter on its way from the kidney to the bladder. These valves are sometimes single and sometimes multiple, two or three in the same ureter. They have been depicted in Rayer's atlas,[1] and are not uncommonly mentioned in the descriptions of specimens in the literature. They cause a gradually increasing impediment to the flow of urine, and effect dilatation of the ureter above and usually near to the valve, so that a ureter with multiple valves will present as many dilatations and constrictions as there are valves. It is natural that if small stones form in the kidney, they should be arrested at the valves.

That such a valve can be successfully operated upon from within the ureter through a longitudinal incision in the latter is well illustrated in the following case:

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[1] Rayer: Traité des Maladies des Reins, Paris, 1837.

CASE. *Synopsis: in* 1880, *at the age of seventeen years, probably traumatic right floating kidney; remittent attacks of pain, reawakened after first pregnancy, in* 1885, *to disappear for eight years, returning in* 1893, *subsequent to miscarriage, to become intermittent or almost constant; pyonephrosis, with tumor in region of right kidney; pelviotomy August* 6, 1895; *removal of four stones from ureter above a valvular stricture; longitudinal ureterotomy over stricture; excision of stricture; plastic operation on ureter; wound in pelvis left open for bougie passed down into ureter; wound healed without fistula in six weeks; patient well in March*, 1896, *seven months later.*—Mrs. G., aged thirty-two years, was referred to me by the courtesy of Dr. E. E. Simpson, and entered the German Hospital, in my service, August 1, 1895. The patient's family history was good. She had had the ordinary diseases of childhood, but was in other respects in excellent health until her seventeenth year. At this time, after jumping from a wagon to the ground, she at once experienced pain in the right side immediately under the ribs, so severe that she fainted. She was not confined to her bed, and the pain was not constant, but after an intermission of several days intense pain, lasting from a few hours to several weeks, would recur. The pain was located in the right hypochondriac region. No blood was noticed in the urine or stools either immediately following the injury or subsequently.

Menstruation commenced at the age of eighteen years, and she was fairly regular and had comparatively little pain or discomfort. She married at twenty-one years; has two children. After the birth of the first child the pain in the side again became quite severe, but during her second pregnancy she complained of little pain. The second child was born three years after the birth of the first, after a tedious labor. On the third or fourth day she had a chill, followed by fever, and during the six weeks following had fever and intense pain in the back, the left half of the abdomen, and the joints in various parts of the body. During the first week after her confinement a large slough, four inches in length, extending from the anus upward over the sacrum, occurred. Five weeks later the gangrenous tissue was removed, but the wound did not heal for three months and a half. During the next four years the patient had three miscarriages. At the time of the last miscarriage, in 1893, the patient had the same pain that she had had fifteen years previously in the right hypochondriac region, ranging to the median line.

The patient was somewhat emaciated; heart and lungs normal; abdominal examination revealed an obscurely defined tumor in the right side of the abdomen, close to the umbilicus, four inches long by three inches wide, dull upon percussion. The tumor was readily movable to the median line and backward to the normal position of the kidney, but attempts to move the tumor caused considerable pain. Vaginal examination showed that the uterus was somewhat enlarged, but in normal position, and not freely movable. Pressure over the ovaries caused only slight pain. The urine contained neither albumin nor sugar.

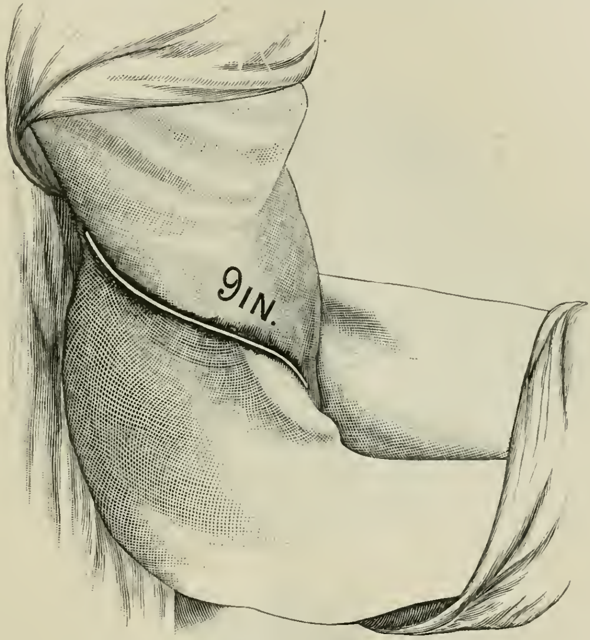
During the attacks of pain she urinates frequently, but passes only small quantities of urine. The pain always begins in the right lumbar region, and from here radiates to the epigastrium, anterior part of chest, right and left inguinal regions, and also sometimes into the leg. She has lost forty pounds in weight during the last seven years.

*Diagnosis.* Cystonephrosis of right movable kidney, probably due to stone in kidney or pelvis. Probably infected.

I therefore advised exploratory incision for drainage and possible removal of stones.

*Operation.* On August 6th I operated in the following manner: the patient was anæsthetized with ether and placed on the left side on a cushion. An incision was made between the twelfth rib and the rim of the pelvis forward for about nine inches from the border of the erector spinæ muscle. (Fig. 1.)

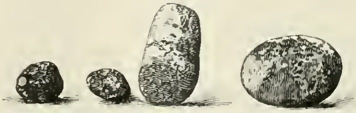
FIG. 1.



Line of incision when wound was nearly healed.

The kidney was large with but little perirenal fat, and was freely movable. Two small cysts presented on the convex surface of the kidney, about the size of a pea, which contained clear fluid. A part of the kidney-tissue which included these cysts was removed for examination. After isolation of the pelvis, which I found to be somewhat dilated, but in which I could feel no stones, I laid bare the ureter and felt a nodular mass two inches below the pelvis. I then incised the pelvis longitudinally and about an ounce of urine escaped, from which cultures were made. I could now insert my little finger down into the dilated ureter for an inch without feeling a stone, but upon manipulation of the ureter with the other hand I was able to squeeze four stones up into the pelvis and remove them through the wound in the pelvis. (Fig. 2.) A sound passed down from the pelvis into the ureter was arrested two and a half inches below the pelvis, at a point where a somewhat soft thickening was felt on palpation. A longitudinal incision was now made three-eighths of an inch long into the ureter upon the end of the sound above, through and below a transverse valvular stricture. A probe inserted through the opening in the ureter below the stricture passed easily down into the bladder. By holding the longitudinal wound open and stretching this part of the ureter over the index-finger I clipped off the valvular stricture (Fig. 3) from within the ureter with scissors, leaving the muscular and internal coats of the ureter intact. I now made my plastic operation on the ureter[1] and inserted a flexible bougie, No. 12, from the wound in the pelvis into the ureter. The wound in the pelvis was left open. Upon digital exploration of the calices through the wound in the pelvis I found the calices moderately dilated, and in one of them a small stone, which I removed. No other stones were found after careful examination. On this account I did not consider it necessary to incise the kidney on its convex surface. Rubber drainage-tubes were then inserted, one down to the wound in the ureter, and another to the pelvis of the kidney. These tubes were surrounded with gauze. The external wound was closed with heavy silk sutures.

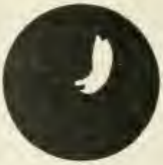
FIG. 2.



Stones from ureter above stricture ; natural size.

The operation occupied two hours. At the close of the operation the patient was in good condition, pulse strong, respiration good. She vomited twice after the operation. In the evening she was catheterized and two ounces of dark-brown urine withdrawn. She complained of severe pain in the wound. During the night she passed four ounces of urine and toward morning the pain decreased.

FIG. 3.



Circular valve in the ureter ; natural size.

Microscopical examination of the valve (Fig. 4) showed that this consisted of firm fibrillary connective tissue, with normal distribution of vessels (*a*), no muscular fibres of the wall extending into it. The free border of the valve looking into the lumen of the ureter (*d*) was clad with stratified cylindrical and cuboid epithelium (*b*). The border of the valve was folded, and thus a cross-section through the bottom of a fold showed an island of cuboid epithelial cells (*c*).

*7th.* The patient vomited several times, complained of severe pain in the afternoon, and passed bloody urine. During the twenty-four hours she passed sixteen and a half ounces of urine. She complained of severe pain in the wound, but was otherwise bright and cheerful. Considerable discharge found in the dressings.

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[1] Fenger : Journal of the American Medical Association, March 10, 1894.

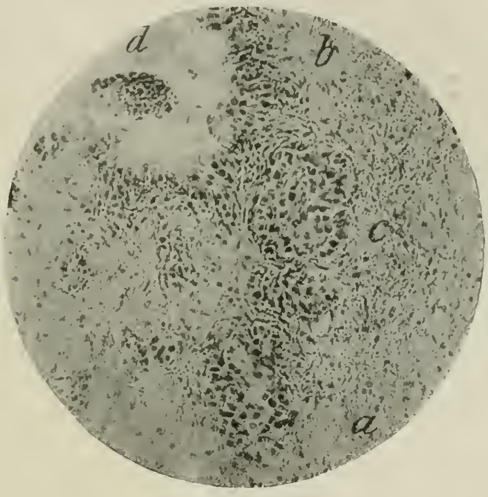
*8th.* The patient passed bloody urine throughout the day and complained of very severe pain.

*9th.* The patient had but little pain during the day, and the nausea and vomiting ceased.

*10th.* The gauze was almost dry, indicating that the urine had passed along the bougie through the ureter.

*11th.* The patient was perspiring profusely for about half an hour in the evening, and a little later complained of severe pain.

FIG. 4.



Microscopic section of valve.

*12th.* Thirty ounces of urine were passed in the twenty-four hours.

*13th.* The patient complains of severe pain. The bougie was removed, but the drainage-tube allowed to remain in place. In the afternoon she complained of severe pain.

*15th.* The patient complains of sharp pain in the bladder at the close of urination and also of pain in the wound.

*20th.* Condition of wound and patient excellent.

*26th.* No urine in the dressings. Drainage-tube to the pelvis of the kidney removed and tube to the wound in ureter shortened.

*September 1st.* Drainage-tube removed.

*8th.* The patient sitting up. Feels strong, and is bright and cheerful.

*20th.* The patient left the hospital for her home. The wound was healed with the exception of a narrow superficial granulating line.

On March 19, 1896, Dr. Simpson wrote me as follows: "Mrs. G. is doing remarkably well."

It will be seen that the operation for infected cystonephrosis in this case was not nephrotomy, as the convex surface of the kidney was not divided at all. Pelviotomy (opening of the pelvis) was made, partly for the removal of the stones squeezed up out of the ureter and partly for the exploration of the ureter and calices.

Exploration of the ureter with the sound led to the detection of the stricture, a valve, which was excised through a longitudinal opening in the ureter at its seat. I consider this operation preferable to excision of the entire wall of the ureter and invagination after Van Hook's method, as it is followed by the least possible shortening of the canal. This point may be of importance if more than valvular stricture should have to be operated upon.

Exploration of the calices can be made just as well through an incision in a somewhat dilated pelvis when the latter is wide enough to permit exploration with the finger and sound. For additional security against leaving stones in hidden calices with narrow entrances it would be well to explore through the convex surface of the kidney with steel needles. When this is done in addition to digital exploration through the pelviotomy-wound I think there is as little risk of overlooking stones as exists when the convex surface of the kidney is divided. To avoid dividing the posterior surface of the kidney avoids hemorrhage, the operation on the pelvis of the kidney being entirely bloodless.

For the local treatment of pyelitis—that is, inflammation of the pelvis and calices—drainage through the wound in the pelvis will be sufficient, at least in ordinary cases of stones and valves in which, by removal of the cause, we may reasonably expect the pyelitis to come to an end.

269 La Salle Avenue.

# A CASE OF SYRINGOMYELIA LIMITED TO ONE POSTERIOR HORN IN THE CERVICAL REGION, WITH ARTHROPATHY OF THE SHOULDER-JOINT AND ASCENDING DEGENERATION IN THE PYRAMIDAL TRACTS.[1]

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If one glances at the extensive literature on syringomyelia, as given in Schlesinger's recent monograph, he feels as though he must offer an apology for adding another case. Syringomyelia with arthropathy followed by autopsy and an examination of the spinal ganglia; ascending degeneration in the direct and crossed pyramidal tracts above the focus

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[1] Read before the American Neurological Association, June 4, 1896.

of destruction in the cord; gliosis extending from the second cervical segment to the extreme end of the conus terminalis; destruction of one posterior horn alone, from the second cervical to the first dorsal segment, with diminution of the lateral column on the same side; pachymeningitis involving a large portion of the dorsal region—these are conditions which seem to justify us in presenting the following case for your consideration:[1]

C. H., male, aged forty-five years, a native of Sweden, unmarried, and a laborer by occupation, was admitted to the nervous wards of the Philadelphia Hospital January 9, 1883. His family history did not appear to be especially significant. His father had died of phthisis, his mother of old age. Two brothers were living and in good health. His personal history previous to the present affection also failed to present factors of importance. He had had typhoid fever when twenty years of age, but no other illness of moment. Venereal history was denied, and he had always been temperate in his habits.

About three years before admission, while working in a sawmill, he did some heavy lifting and strained his back. He was obliged to go to bed for a day, but afterward felt no evil effects. About three years later he began to suffer from pains in the legs and a band-like pain about the lower part of the chest. These pains gradually grew worse, and soon his walking was interfered with. He noticed that his legs were getting weak, and that he could not walk as well as formerly. His feet would drag slightly and the toes would occasionally catch upon the ground and cause him to fall. He noticed also occasional cramp-like pains in the calves of his legs. Gradually loss of power became more and more marked, and when admitted to the hospital he was unable to walk, but could sit up in a chair.

The legs presented the symptoms of spastic paraplegia, and later on marked contractures made their appearance. Gradually loss of power became complete, and he lay in bed for the last four or five years with both legs drawn upward toward the trunk, especially the right, the thighs being flexed more or less upon the abdomen and the legs flexed upon the thighs. He could not move the legs in the least, and rigidity was so great that it was impossible to extend them even passively. The knee-jerks were both markedly exaggerated. On the right side, however, the reaction gradually disappeared, owing to the fixed position of the limb. Ankle-clonus was also present, but was finally lost, likewise due to the fixation produced by the contracture. General muscular wasting also took place in both thighs and legs.

Early in the case the bowels were constipated, and he had also difficulty in voiding urine. Little by little paralysis of retention set in, and finally both bowels and bladder were emptied without the patient's knowledge.

Cutaneous sensibility was early lost in the legs; but the nature of the affection was not suspected until 1890, when a detailed examination revealed not only that the cutaneous sensibility was absolutely lost in both legs, but that this loss extended also upward upon the trunk anteriorly and posteriorly; upon the right side as far as the level of the nipple, and upon the left a little above the level of the umbilicus. The areas in which cutaneous sensibility was lost and those in which it was preserved were not sharply demarcated. In examining him with the æsthesiometer from below upward his answers were at first uncertain as the levels mentioned were approached, and only when these levels were fairly past did his answers become positive. In all portions of the body, save the legs and the portions of the trunk already mentioned, tactile sensibility was well preserved. It was found, however, that the sense of temperature was absolutely lost over the right arm, the right shoulder and the right side of the neck, and also upon the adjacent portions of the trunk above the nipple-line. There was also some analgesia of the right arm, though this was not absolute (see Figs. 1 and 2). The band-

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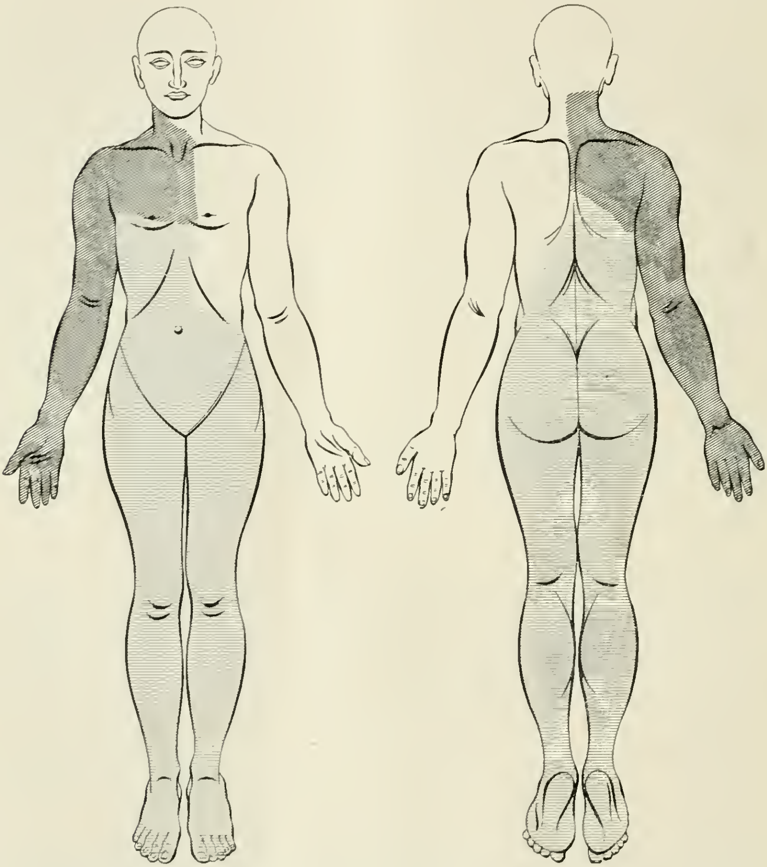
[1] See also clinical lecture delivered at the Philadelphia Hospital, 1890, by one of the writers. International Clinics, second series, vol. ii. p. 108.

Fig. 1. Fig. 2.

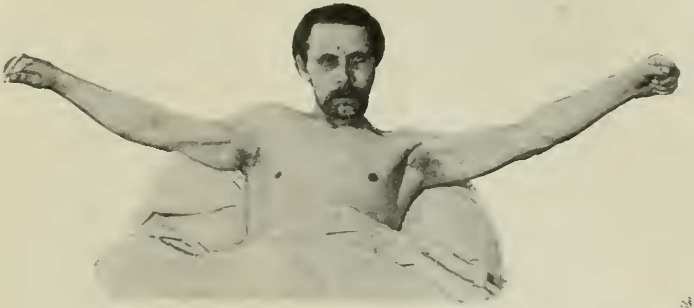


In the areas shaded lightly there was loss of sensation to all forms. In the areas shaded heavily there was absolute loss of the temperature-sense and a decided impairment of the pain-sense. In the unshaded areas sensation was normal.

like pains upon the chest noted early in his case steadily persisted, and were referred more especially to the fourth, fifth, and sixth intercostal nerves upon the left side.

In 1888 it was noticed that the right shoulder had become swollen. Examination of the joint revealed that the joint-surfaces were much roughened, and also that some effusion had taken place into its cavity. No pain was present at this time. For a time the effusion steadily increased, and finally rupture of the capsular ligament with infiltration of the subcutaneous and intermuscular connective tissue took place. A cellulitis resulted, which presented the ordinary symptoms of swelling, redness, and local heat, but with a very slight degree of pain. After a number of weeks the effusion was again absorbed, and it was then noticed that when the patient attempted to extend the right arm that the humerus assumed the position of a subglenoid luxation. (See Fig. 3.)

FIG. 3.



From a photograph taken in January, 1890, showing the arthropathy of the right shoulder.

At various times the effusion into the joint recurred, and at such times a pouch-like dilatation of the capsule would distend the axilla. Little by little the humerus shortened, considerable destruction of bone taking place.

In addition to the above facts the patient presented nothing of importance, save that on several occasions he developed small abscesses—one, for instance, over the left ilium and over the left gluteal region. Bedsores also made their appearance at various times and persisted until the end. Mentally he was extremely irritable, ascribing his affection to an overdose of arsenic, which he claimed had been administered to him by a resident physician in mistake.

The examination of the blood revealed nothing of importance. An examination of the eyes by Dr. de Schweinitz was negative.

Up to about two years ago the patient's general condition remained fairly good; but little by little emaciation set in, and he finally died with symptoms of exhaustion on the 14th of December, 1895.

*Autopsy*, December 14, 1895. Body much emaciated. Emaciation general; no local atrophies. Both legs contracted, the right leg abducted and semiflexed, the left leg adducted and partly flexed. A large, gangrenous bedsore covered the lower two-thirds of the sacrum. A similar bedsore was also noted over the right tuberosity of the ischium and one over the right trochanter.

*Brain.* Scalp unusually thin. Calvarium normal, save perhaps that the diploic structure was less pronounced than usual. Pacchionian bodies small in number. External layer of the dura normal; its internal layer smooth and whitish-gray in color. Veins of the pia not distended. The cerebro-spinal fluid about normal in amount. The brain as a whole was softer than normal. There was, however, no local softening, the latter being everywhere diffuse. The cerebellum seemed slightly firmer than the cerebrum. The meshes of the pia and arachnoid were somewhat œdematous. The pia was readily detached from the cortex. Vessels of base rather small, otherwise normal, except here and there an atheromatous patch. Ventricles not dilated; their walls rather pale. Velum interpositum normal, its veins not distended. Choroid plexuses normal and but slightly cystic. Foramen of Monro normal, not dilated. Walls of the third ventricle slightly pale. On section the brain seemed moist, but revealed very few puncta vasculosa. There were no lesions of the basal ganglia or capsules. The crura were normal on section. Pons and medulla likewise normal. No dilatation of aqueduct of Sylvius nor of central cavity in lower portion of medulla.

*Spinal Cord.* The dura of the cord was adherent almost in its entire thoracic portion. The substance of the cord was very soft, especially in the dorsal region. In this region also the dura mater was much thickened.

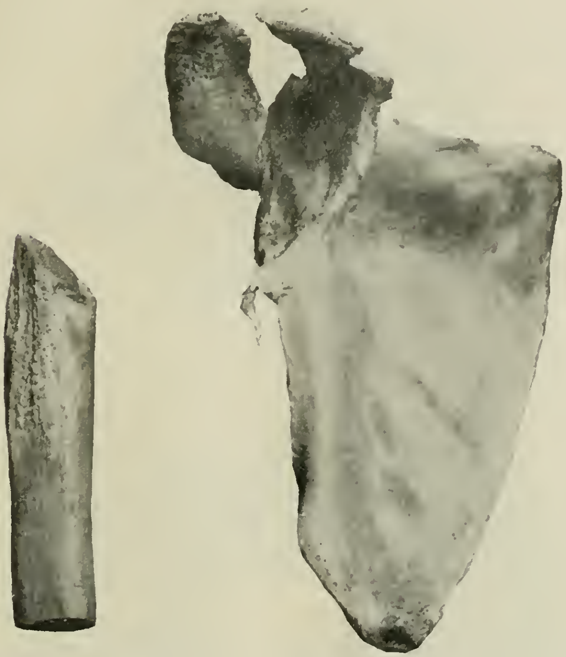
*Thorax.* Left pleura free from adhesions. About two ounces of fluid in pleural cavity. Right pleura extensively adherent; adhesions firm and difficult to break. Lungs crepitant. Right lung somewhat œdematous in lower lobe, but pieces of the latter floated readily. Some frothy mucus in bronchi. No tubercular deposit. Bronchial lymphatic glands small and pigmented. The pericardium was smooth and contained a normal amount of fluid. Heart-muscle pale and flabby. Both ventricles distended with dark fluid blood. No lesions of heart-valves; no atheroma of aorta.

*Abdomen.* On opening the abdomen a large amount of sero-purulent fluid, estimated at about thirty ounces, escaped. The omentum was very thin, containing little or no fat. It was adherent to the small intestine. The small intestine and the ascending, descending, and transverse colon were matted together by extensive old peritoneal adhesions. The viscera were everywhere covered by extensive exudate, apparently old. The stomach was distended, a large amount of yellow chyme escaping from the œsophageal opening. The mucous membrane was exceedingly pale, presenting here and there minute patches of erosion. These erosions were present both on the anterior and posterior walls.

The spleen was normal in color and consistence, but small. The liver was evidently diminished in size; capsule not adherent; cut surface distinctly paler than normal. The kidneys presented adherent capsules and fatty changes, especially in the cortex, which was also here and there a little thinner than normal.

On examining the right shoulder-joint it was found that the proximal end of the humerus was in the position of subglenoid luxation, and that it was freely movable and could be readily reduced. On opening the joint it was found that its capsule was much thickened and the inner surface of the latter much roughened. The head of the humerus had disappeared, the bone having been eroded to some little distance below the surgical neck. The surface of the glenoid cavity was relatively smooth, but the adjacent portions of the capsular ligament were festooned with vegetations. Here and there it was villous. A cystic tumor was also found in the axilla containing a friable fatty material. The cavity of this tumor communicated with the cavity of the joint by a small sinus. The scapula, a portion of the humerus, and portions of the capsular ligament were removed. Subsequently they were prepared, and are herewith presented. (See Figs. 4 and 5.) The humerus presents complete loss of the head and surgical neck, the proximal end being represented by a porous surface extending obliquely upward and outward. Adjacent portions of the shaft are also much roughened and porous. The scapula likewise presents extensive changes. The surface of the glenoid cavity has been much eroded, and has become roughened and porous; but this is neither the most interesting nor the most striking feature. The glenoid surface seems to be abnormally large, and upon examination it is seen that extensive bony deposit has taken place along its edges. This deposit is especially marked upon its posterior and inferior edges. The latter is curiously festooned. Immediately back of the posterior portion of the glenoid cavity other extensive deposits are noted. The coracoid process also exhibits marked changes. Not only is it thickened, roughened, and porous, but it exhibits around its entire edge a thick and firm accretion, averaging at least a half-inch in width. The latter is separated from the coracoid itself by a well-marked line of demarcation.

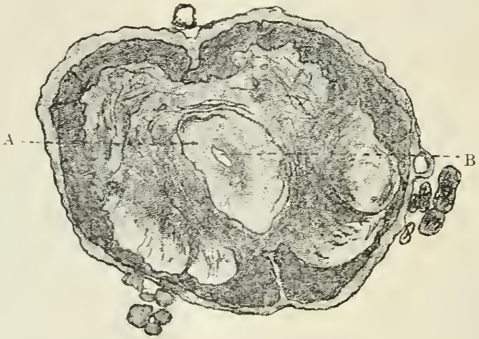
FIG. 4. FIG. 5.



Humerus and scapula of the right side. The head of the humerus has been destroyed. The glenoid surface of the scapula is enlarged, and its edges are thickened by bony deposit. The coracoid process presents peripheral accretions.

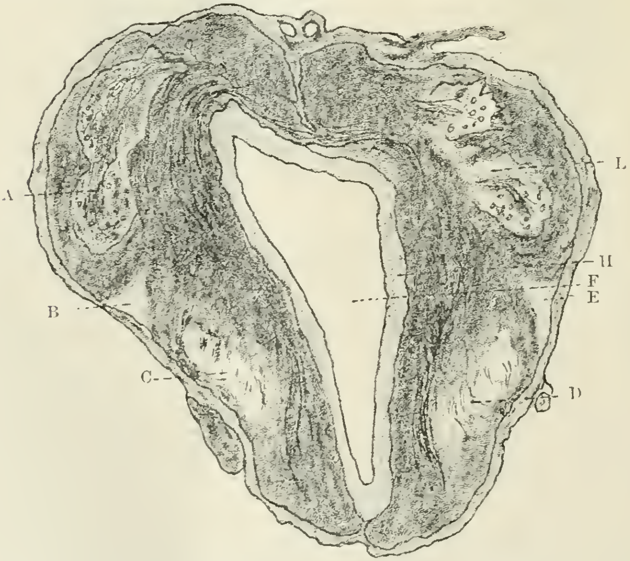
The central nervous system, with portions from several nerves, was placed in Müller's fluid, and sections were made from levels corresponding to nearly every spinal root, and stained with carmine, Delafield's hæmatoxylin, and by the methods of Weigert, Pal, and Marchi. Numerous sections were also made from different spinal ganglia. The microscopic work was done in the Pepper Laboratory.

FIG. 6.



Section from extreme end of conus. A, tumor-like mass broken down in the centre at B.

FIG. 7.



Section from the level of the fifth lumbar roots. A and L, anterior horns; B and E, degenerated crossed pyramidal tracts; C and D, posterior horns; F, cavity occupying the area of the posterior septum; H, gliomatous tissue.

*Conus Terminalis.* (See Fig. 6.) Sections from the extreme end of the conus show a tumor-like mass occupying the centre of the cord and containing a small central cavity. The borders of the gliosis are well defined by fibres, colored black by the method of Weigert. The tissue bordering the cavity appears looser in structure than that more peripheral, and shows a tendency to a radiated structure. The nuclei of the neuroglia-cells are more abundant toward the periphery of the mass. The posterior columns are very slightly involved and only at their anterior portion.

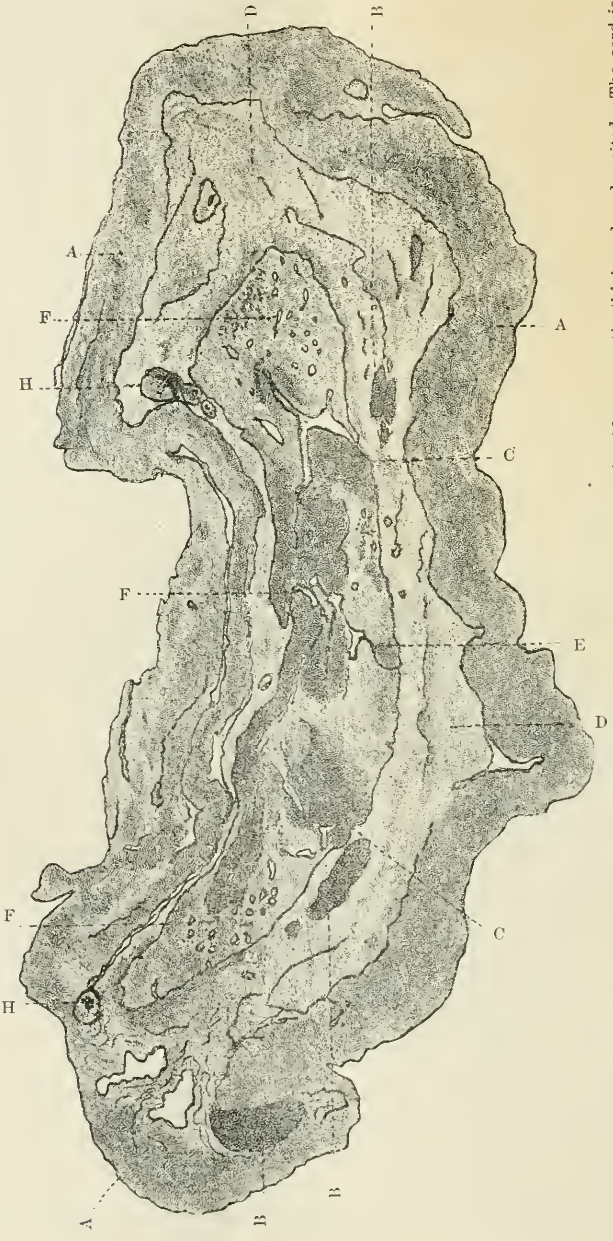
*Upper Part of Sacral Cord.* The cavity occupies a greater portion of the tumor, which involves the anterior part of the posterior septum and both anterior horns, especially the left. The vessels at the border of the gliosis are somewhat sclerosed. The cavity appears almost as if formed by the removal of a portion of the tissue by the knife in cutting the sections, owing to the absence of any thickening in the growth at this part.

The central canal is not involved in the tumor, but a mass of proliferated cells is found in the area usually occupied by it. This condition is well known in normal cords. In some sections at this level the canal is found patulous and lined by an unbroken layer of cylindrical cells. The anterior and posterior roots show no change; indeed, the posterior are normal throughout the cord in their extramedullary portion, whereas in a part of the thoracic cord the anterior are degenerated.

*Fifth to Second Lumbar Segments.* (See Fig. 7.) The cavity now extends along the posterior septum almost to the pia mater. The cells of the anterior horns are numerous. The crossed pyramidal tracts are degenerated. The central canal is patulous at the level of the fourth and third lumbar segments and lined with ependymal cells, and is anterior to the tumor. The gliosis does not alter its shape essentially until at the level of the second lumbar segment, in which region it is no longer triangular with its apex at the junction of the periphery with the posterior septum, but is irregular in shape and occupies a large part of the cord, which contains little normal tissue. The pachymeningitis makes its appearance at the second lumbar segment and extends to the exit of the third dorsal roots.

*Exit of Eleventh to Exit of Fourth Thoracic Roots.* (See Fig. 8.) It was impossible to count the roots at their junction with the cord except by tearing away the thickened membranes; we have, therefore, been obliged to count the segments according to the points of exit of the roots from the dura. There are round-cell infiltration and proliferation in the greatly thickened membranes, even the spinal roots are involved, but within the thickened meninges the fibres of the posterior roots are found apparently normal; the anterior are much degenerated at the level of the exit of the fourth thoracic roots. The posterior horns are especially involved in the destruction of tissue. Very few bands of normal nerve-fibres are found within the cord, which is almost entirely replaced by the gliosis and cavity. The cord is closely united with its membranes. The vessels of the meninges and cord are thickened and show hyaline degeneration; many are surrounded by a clear zone faintly colored by the carmine. The pachymeningitis at the exit of the fourth thoracic nerve is more confined to the posterior part of the cord. The cavity extends to the pia through the posterior horns in sections where the pachymeningitis is most marked. The endothelial layer between the dura and the arachnoid shows the proliferation described by Köppen. The only hemorrhages which can be noticed—small and few in number—are in the loose, fatty connective tissue external to the dura. In some sections the vasa vasorum are enlarged about a small artery in the cord. Abundance of amyloid bodies may be seen. The pia is thickened both above and below the parts where the dura has again become normal.

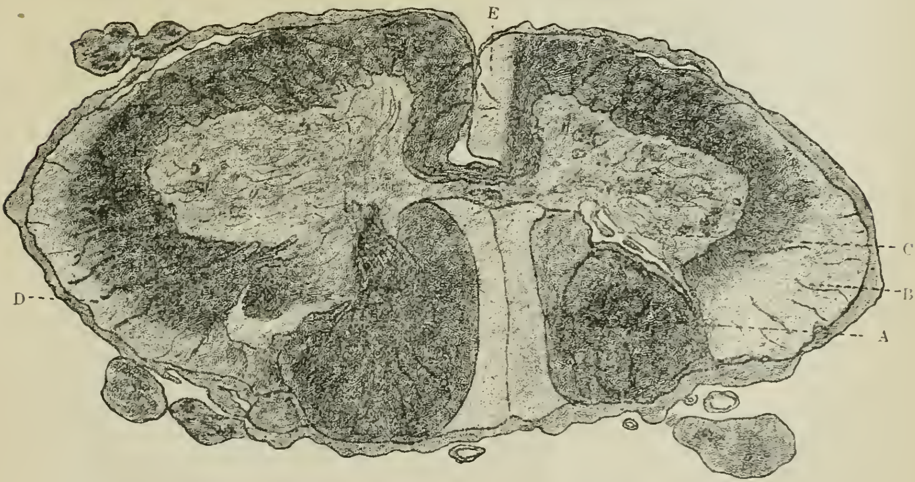
FIG. 8.



Section from the level of the exit of the eighth thoracic roots. The dura, pia, and arachnoid are greatly thickened and united. The cord is flattened and entirely degenerated except at C C, where a few medullated fibres are still to be seen. Scattered medullated fibres may also be found in a few other regions. Gliomatous tissue occupies a large portion of the cord, and in certain places, as at E, is broken down and causes cavity-formation. A. Thickened dura. B. Posterior roots not degenerated, a few fibres may possibly be found not perfectly normal, but these are rare. C, C. Masses of medullated fibres in cord. D. Thickened arachnoid and pia. F. Posterior septum containing a cavity. F, F. Thickened bloodvessels in the lateral columns. H. Greatly degenerated anterior roots. I. Anterior fissure.

*Level of First and Second Thoracic Segments.* The cavity shows a tendency to become limited to the right posterior horn, noticeable in the second thoracic segment and especially in sections from the first thoracic; in the cervical region it does not extend to any other part of the cord. The walls of the cavity are formed by a slight thickening of the neurogliar tissue, but the dense structure seen in sections from lower segments no longer exists. The cavity appears more as a tear in the normal tissue, with a slight band of thickened neuroglia containing numerous deeply stained nuclei along a portion of its walls. Considerable degeneration is noticed in both lateral columns, especially in that of the right side, and also in the right anterior column along the anterior fissure. The left anterior column is apparently normal. This degeneration is due to destruction of tissue lower down. The pia is very much thickened. The peripheral zone of neuroglia (peridym of v. Lenhossék) shows the thickening described by v. Lenhossék in all chronic spinal processes. The sclerosis involves the direct cerebellar tract and Gowers's column on each side of the cord. The right column of Goll and the anterior part of the left are destroyed as high as the first thoracic segment. Above this region the right lateral column is not occupied by the cavity or gliosis except in the form of secondary degeneration. We employ the term gliosis as distinctive from gliomatosis in the sense given by Hoffmann.

FIG. 9.



Section from the level of the eighth cervical roots. The entire right side of the cord is smaller than the left. A. Contracted posterior horn. B. Crossed pyramidal direct cerebellar and Gower's tract degenerated upward. C. Cavity limited to the posterior horn. E. Ascending degeneration in the area of the right pyramidal tract. D. Degeneration in the direct cerebellar and Gower's tract of left side.

*Cervical Cord* (See Fig. 9) *and Medulla.* The columns of Goll are entirely degenerated, and extend laterally at the eighth segment along the posterior commissure in a flask-shaped form; this appearance is not long preserved, but the degeneration in these columns does not withdraw from the posterior commissure. The degeneration in the left lateral column except along the periphery is not very marked, and cannot be traced very high; in the right lateral column it is more noticeable and may be traced into the substantia reticularis as high as the second cervical segment, decreasing gradually in intensity. This degeneration is not closely confined to the area usually considered as occupied by the fibres of the crossed pyramidal tract, although more intense in this portion. The degeneration in the right anterior column is very noticeable at the lower portion of the cervical cord, and may be traced in gradually decreasing intensity into the motor decussation, at which level it has almost ceased. It is chiefly located along the right border of the anterior fissure.

In the right lateral column in the eighth segment a few swollen axis-cylinders are noticed, and by the method of Weigert most of the fibres which are preserved are seen to be of small size. Such fibres are not observed in the degeneration of the columns of Goll, which contain only a very few medullated fibres. There is a semi-circular band of degenerated tissue in the right column of Burdach, seen only in the eighth segment, which passes from the neck of the posterior horn with the concavity outward and joins the degenerated columns of Goll about halfway toward the periphery. In this band these small nerve-fibres may also be found. It has not exactly the location of Schultze's comma-zone. The right posterior horn is very small, and is replaced antero-posteriorly by the cavity, which extends as high as the second cervical segment. There is in all cervical sections a zone of sound tissue between the median end of the cavity and the central canal. The degeneration along the periphery of each lateral column in the area occupied by the direct cerebellar tract and the column of Gowers, a little more intense on the right side, extends beyond a line drawn through the anterior part of each anterior horn, but decreases in intensity in ascending and withdraws toward the posterior horn. The right posterior roots appear normal in their extramedullary portion, but only very few fibres are found, and these merely in certain sections, entering the right posterior horn. They can be traced only a very short distance. In the lower cervical region the whole right side of the cord is smaller than the left, especially noticeable in the right lateral column, and the right anterior horn contains fewer fibres, probably the result of loss of fibres from the right posterior roots. The ganglion-cells appear normal. The lateral limiting layer (Grenzschicht of Flechsig) is not degenerated in any part of the cervical cord, probably because this zone contains short associative fibres. In the second cervical segment a narrow band of neurogliar tissue is found in the right posterior horn, corresponding to the location of the cavity below. This band is rich in cells with deeply stained nuclei, a condition which agrees with the statements of Hoffmann[1] that the gliosis is especially rich in cells where it is progressive. The right posterior horn is very narrow, and does not become broad at any part before its final disappearance. The sclerosis corresponding to the columns of Gowers cannot be traced apart from that of the direct cerebellar tracts. It becomes less in degree and finally disappears in the restiform bodies. At the second cervical segment there is a partial separation of the two tracts on the right side, but this is not apparent in sections from a higher level. This decrease in intensity would seem to indicate that

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[1] Hoffmann: Deutsche Zeitsch. f. Nervenheilk., 1892, vol. iii. p. 85.

the direct cerebellar tracts receive fibres in the cervical region. The degeneration in the columns of Goll does not go beyond the nuclei of these columns. The columns of Burdach are not degenerated in the cervical cord; there is great destruction in the right column of Burdach at the first dorsal, and yet from the seventh cervical segment no degeneration can be seen in these columns, confirming the statements that in the cervical region they are chiefly formed by fibres from the upper extremities.

There is no degeneration in the anterior pyramids and none in the fillet. Had the cavity in the right posterior horn extended a little higher there would have been bulbar symptoms added without paralysis in the upper extremities.

*The Ascending Degeneration.* Ascending degeneration in the lateral columns has been known for a long time, but forgotten until within the last few years. Klippel and Durante[1] give the limited literature on this subject up to 1895. Probably the first clear statement of this condition is to be found in the thesis of Michaud,[2] published in 1871, in which the following words may be found, which, when translated, read as follows: "It is not uncommon to find an ascending sclerosis in the lateral columns above the lesion; but, as a rule, it soon becomes indistinct and does not extend to a great height."

In May, 1893, Williamson[3] described degeneration of the direct pyramidal tracts in the upper thoracic and lower cervical regions which extended about four inches above a focus of transverse myelitis to the junction of the upper with the middle third of the cervical cord. The crossed pyramidal tracts were not involved above the lesion. He considered it probable that a localized spot of myelitis had at one time involved the direct pyramidal tracts, and that the degeneration was to be explained by the well-known law of Waller. Sottas[4] (November 25, 1893) reported four cases of spinal syphilis in which the crossed pyramidal tracts showed an ascending degeneration beginning in the thoracic region and extending in gradually diminishing intensity into the cervical. He gave this the name of "retrograde degeneration." He traced the sclerosis to its termination in the cervical cord, stated that it could not be due to a lesion higher up, emphasized the fact that the intensity of the process diminished in proportion to the distance of the section from the focus, and compared the condition to the degeneration of the central end of cut peripheral nerves.

In 1894 Raymond[5] reported ascending sclerosis of the crossed pyramidal tracts, and Gombault and Philippe[6] four cases, in one of which the direct pyramidal tracts were also affected. In two of their cases this was due to syringomyelia. In 1896 Dejerine and Sottas[1] have added one more case of ascending degeneration in the direct and crossed pyramidal tracts. According to Dejerine and Sottas, ascending degeneration has also been reported by Werding, Schmauss, and Daxemberger.

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[1] Revue de Médecine, 1895, p. 598.

[2] Méningite et myélite dans le mal de Pott. Thèse de Paris, 1871.

[3] British Medical Journal, 1893, vol. i. p. 946.

[4] Comptes Rendus des séances de la Société de Biologie, November 25, 1893.

[5] Arch. de Neurologie, February, 1894, Case III.

[6] Arch. de Médecine Expérimentale. 1894.

We can find no case in which this degeneration was unilateral in the spinal cord, as in the case we now report. The direct pyramidal tract was involved in the cases of Williamson, Gombault and Philippe, Dejerine and Sottas, and in ours.

James Hendrie Lloyd[2] (March, 1893), in his description of a case of syringomyelia, mentioned particularly that he had observed degeneration of one pyramid in a section taken above the termination of the cavity, and gave a picture of the section.

Hatschek[3] describes degeneration of both pyramids in a case of syringomyelia, which he does not believe to be of the ordinary descending type.

Schlesinger,[4] who has studied the literature of syringomyelia so carefully, states that Schultze, Rossolimo, Hoffmann, and Miura have mentioned a similar condition. In Schlesinger's cases, from lesion of the oblongata, the degeneration was more intense in the cerebral portions of the pyramids than in the spinal, owing to the presence of fibres in the former, which do not descend into the cord. He considers this degeneration of the pyramids as retrograde.

In our case there can hardly be any doubt of the existence of this ascending (cellulipetal, retrograde) degeneration in the right lateral column, involving the area of the crossed pyramidal tract especially, and extending from the upper thoracic region to the substantia reticularis of the second cervical segment, and in the right anterior column from the upper thoracic region to the motor decussation. The degeneration in the left lateral column does not extend very high. We base our conclusions on the following facts:

1. Absence of any macroscopic lesion above the medulla.
2. Degeneration of the crossed and direct pyramidal tracts on the *same* side of the cervical cord, intense in the lower cervical region near the focal lesion and diminishing gradually in intensity in the cervical segments, and finally becoming very indistinct in the upper cervical region.
3. Absence of all degeneration in the anterior pyramids.
4. Long duration of a chronic disease.

Owing to the kindness of Drs. Dejerine and Sottas, we have examined the preparations of the case published recently by them, and must consider that the degeneration we describe is not unlike theirs, although almost entirely unilateral. It is Dr. Sottas who has made this retrograde degeneration prominent. In our case the crossed pyramidal tract contains many fine, possibly atrophied, fibres and some few swollen axis-cylinders, and the sclerosis is by no means so great as in the cellulifugal degeneration of the columns of Goll. This cellulipetal degeneration in motor nerves and motor roots has been known for some time (see *Traité de Médecine*, tome vi. p. 662, and case reported by Dejerine and Spiller[1]).

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[1] Archiv de Physiologie, January, 1896.

[2] University Med. Mag., March, 1893.

[3] Wiener med. Wochenschrift, 1895, p. 1154.

[4] Arbeiten ans dem Institut. für Anatomie u. Physiologie, Obersteiner, Heft iv. 1896.

In our own cases certain fibres of association may be considered degenerated, but attention must be called to the fact that it is the area occupied by the direct and crossed pyramidal tracts which is chiefly affected, whereas associative fibres are found in the entire antero-lateral column. The sclerosis is probably due in greater part to atrophy of motor fibres deprived of their function, as it has been noted in cases only of long duration. The less involvement of the left side of the cord in this retrograde degeneration may be explained by the supposition that the right side of the thoracic portion of the cord was affected before the left, and that the process is therefore older on this side. The limitation of the gliosis to the right posterior horn in the cervical cord and the predominance of the clinical phenomena in the right lower limb some years before death render this view probable.

*Columns of Gowers and Direct Cerebellar Tracts.* The sclerosis in these tracts, more especially on the right side, is intense, and yet it is impossible to separate one of these from the other in the medulla oblongata and to trace the degeneration of Gowers's tract into the pons, as has been done by v. Monokow, Flechsig, Loewenthal, Auerbach, Mott, Tooth, Patrick. By some of these the tract was followed much further. Gombault and Philippe[2] were equally unable to separate the degeneration of these two tracts. In our case the sclerotic area gradually diminishes in intensity and withdraws toward the posterior horn, and finally disappears in the inferior cerebellar peduncle. Gombault and Philippe have recorded a similar diminution of the sclerosis in the direct cerebellar tracts, which they consider an anomaly. We are rather disposed to believe that the direct cerebellar tract receives fibres within the cervical cord as well as within the dorsal. Scattered cells corresponding to the location of the columns of Clarke have been noted in the cervical region. The sclerosis in our case may be from direct lesion of the fibres of these tracts or of the cells of the gray matter supplying the tract of Gowers and of those in the columns of Clarke. It cannot be a mere thickening of the peripheral neurogliar tissue described by v. Lenhossék[3] as common in all chronic spinal processes.

*Pachymeningitis.* This case shows intense pachymeningitis from the second lumbar to the exit of the third thoracic roots. This explains the pain felt in the fourth, fifth, and sixth intercostal nerves of one side. In most cases of syringomyelia the pia and dura are normal, but Hoffmann has found more than a dozen cases with thickening of the spinal membranes, usually in the cervical region. Joffroy[1] claims that in pachymeningitis cervicalis hypertrophica the inflammation penetrates into the cord from the membranes. Rosenblath,[2] Ziegler,[3] and others entertain a similar opinion. Hoffmann considers the pachymeningitis secondary to the syringomyelia. Wieting[4] and Köppen[5] object to the title of pachymeningitis for the form described by Charcot, and claim that the cord and membranes are involved simultaneously.

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[1] Comptes Rendus des séances de la Société de Biologie, 1895.

[2] Loc. cit., p. 568.

[3] Der feinere Bau des Nervensystems, p. 247.

In our case the pia is thickened where the dura is normal, which points perhaps toward an origin in the cord, and the intensity of the fibrous thickening and of the vascular changes in the membranes corresponds to the location of the greatest alteration in the cord and its vessels. At this part also the posterior horns are much affected. According to Hoffmann, the posterior horn is the part by which the cavity usually reaches the pia. The pachymeningitis is only in the thoracic region, and while the limitation of this process to the cervical cord has been shown by Adamkiewicz,[6] Wieting, Bouchut,[7] Köppen, etc., to be incorrect for some cases, still the normal condition of the cervical membranes in our case, where the cavity is very small and the intense involvement of the thoracic portion where the syringomyelia is most prominent, must be regarded as somewhat atypical for primary pachymeningitis, and as indicating a simultaneous affection or one secondary to the cavity-formation in the cord. Other cases are reported in which the pachymeningitis was situated where the cavity-formation was most intense, as in Rosenblath's case, No. IV.

We are inclined to believe that in our case the two processes were simultaneous, although there are certain conditions which seem to indicate possibly a primary location in the cord.

The vertebral canal is considerably narrower in the thoracic region than in the cervical and lumbar; the cavity at this level occupied more of the cord than at any other part, and during life contained fluid which probably distended the cord considerably. Pressure must have been especially great here, and perhaps to this cause is due the pachymeningitis in the thoracic region.

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[1] De la pachyméningite cervicale hypertrophique. Paris, 1873.

[2] Deutsche Archiv f. klin. Med., 1893, No. 51, p. 210.

[3] Lehrbuch der speciellen path. Anatomie, vol. ii. p. 313.

[4] Ueber Meningomyelitis mit besonderer Berücksichtigung der Meningomyelitis cervicalis chronica. Inaug. Dissert., Marburg, 1893.

[5] Archiv f. Psychiatrie, 1895, xxvii.

[6] Pachymeningitis hypertrophica u. der chronische Infarct des Rückenmarks. Wien, 1890.

[7] Gazette de Hôpitaux, 1877 to 1879.

*Arthropathy of Right Shoulder.* We had hoped to be able to contribute something to the knowledge of these arthropathies, and with this end in view many of the spinal ganglia have been examined, but in the fifth cervical ganglion of the right side no very decided changes were found. It is true that the vessels were much distended, more so in the fifth and seventh ganglia of the right side than in any others. The sixth cervical ganglion of this side was not obtained. There were many cells with deeply stained nuclei (possibly a round-celled infiltration); some of the ganglion-cells had shrunken from their capsule, but the nerve-fibres appeared normal; fatty degeneration, intense pigmentation, marked cloudiness, deeply colored protoplasm, irregular nuclei, absence of nuclei, destruction of the entire cell, proliferation of the cells of the capsule and the occupation by these of the intracapsular space, decribed by Wollenberg[1] and Stroebe[2] in tabes, are absent. The spinal ganglia have not often been examined in syringomyelia. Holeschnikoff found no decided changes in them, and in Hoffmann's case, in which trophic changes in the fingers and arthropathy at the wrist-joint had been present, the spinal ganglia corresponding to these parts were found unaltered.

In the cord the cavity at the fourth, fifth, and sixth segments is located as in lower levels; we cannot, therefore, attribute this arthropathy of the shoulder to any different conditions existing at these parts. Darkschewitsch,[3] in discussing the synovitis of joints which occurs in the paralyzed limbs after hemiplegia, considers this as due to altered vascular circulation. According to his view, if one would explain this by hypothetical trophic nerves, he must assume that the same nerve-elements serve as trophic centres for the most different tissues which form the components of a joint. He will not decide which of the vasomotor fibres are affected. The vascular system is much involved in paralyzed limbs; we have only to refer to the œdema seen in such cases. Charcot, basing his opinion on four autopsies, believed that the arthropathies in hemiplegia are due to synovitis (quoted by Darkschewitsch). In the cases described by Darkschewitsch the enlarged, painless joint seen in tabes and syringomyelia does not seem to have been present. Fraenkel,[4] in a recent paper, has shown the frequency of vascular along with nerve-alterations in the trophic changes of tabes, neuritis, syringomyelia,ulcers, as presented by arthropathies, etc., and in experimentation in cutting certain peripheral nerves. He believes that the so-called trophic disturbances must be considered chiefly as vasomotor and angiosclerotic in nature. If this idea be accepted, we have perhaps an explanation of the heaping up of bony tissue in the joint in some cases of arthropathy as due to excess of nutrition from dilatation, and of wasting in other cases as due to contraction and angiosclerosis of the vessels.

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[1] Wollenberg: Archiv f. Psychiatrie, 1892, xxiv.

[2] Stroebe: Centralblatt für allgemein. Path. u. path. Anat., 1894, p. 853.

[3] Darkschewitsch: Archiv für Psych., 1892.

[4] Fraenkel: Wiener klin. Wochenschrift, 1896, Nos. 9 and 10.

While we would be loath in the light of our present knowledge to attribute all trophic changes to a vascular origin alone, it seems that a large part of them are due to alterations in the circulation as well as to loss of sensation in the part, the exposure of a paralyzed limb to injury, uncleanliness, and other similar causes. The few cases of chronic anterior poliomyelitis followed by autopsy which are recorded—not more than seven or eight as collected by Nonne[1]—and the recent case of pure motor neuritis reported by Dejerine and Sottas,[2] in which trophic changes other than atrophy were absent, indicate that trophic fibres, if they exist, are not to be found in the peripheral motor neurons. Cases of tabes and syringomyelia point to the sensory neurons as the location of these disturbances.

Such conditions as loss of teeth, perforating ulcers, arthropathies, fragility of the bones, glossy skin, vitiligo, herpes, pemphigus, brittleness of the nails, discoloration and loss or excessive growth of hair, etc., do not seem to be dependent on the motor neurons.

Schaffer[3] has recently found the motor cells of the lumbar region diseased in a case of tabes with arthropathy of the knee. He employed the method of Nissl. We cannot decide from his paper whether the cells on the side corresponding to the arthropathy were more involved in the degenerative processes or not; nor does it seem to us improbable that these slight changes in the motor cells were due to alteration in the reflex collaterals. It is not known how frequently they occur in cases of tabes without arthropathies. Possibly the axis-cylinders of some of these diseased cells were to be found in the posterior roots.

Schlesinger[4] has collected fifty-three cases of syringomyelia with arthropathy, of which eleven only were confirmed by autopsy. To this number he adds four cases of his own. This case of ours, according to his statistics, makes the sixteenth.

Posterior Roots. Considerable confusion exists in regard to the condition of the posterior roots in syringomyelia, and the questions arise whether disease of the posterior roots can lead to syringomyelia, as combination of tabes with this affection is known, and whether destruction of a posterior horn can cause degeneration in the peripheral sensory fibres, even when the spinal ganglia are intact. According to Joseph,[5] fibres are found in the posterior roots which do not enter into relation with the cells of the spinal ganglia, whose trophic centres are in the cord, and v. Lenhossék,[1] Cajal,[2] and Van Gehuchten[3] have been able to demonstrate fibres which leave the cord through the posterior roots, at least in the chick. Retrograde degeneration must also be considered in this connection. Our case is in accord with those of Hoffmann, for even where the pachymeningitis is intense the posterior roots appear normal, as was observed also in a similar case of Gombault and Philippe,[4] and, although few or no fibres can be seen entering the right posterior horn in the cervical cord, the extramedullary portion of the roots is normal. There is no degeneration in the right column of Burdach in the cervical cord, as the fibres which enter into the formation of this column do not pass through the degenerated posterior horn.

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[1] Berliner klin. Wochenschrift, 1896, No. 10.

[2] Comptes Rendus des séances de la Soc. de Biologie, 1896.

[3] Revue Neurologique, Feb. 29, 1896.

[4] Die Syringomyelie.

[5] Joseph: Archiv für Anatomie und Physiologie, 1887.

LIMITATION TO ONE POSTERIOR HORN. Oppenheim[5] is authority for the statement (1893) that there are only two cases recorded of unilateral syringomyelia with corresponding symptoms and confirmation of the diagnosis by autopsy. These are the case of Rossolimo,[6] and the one of Dejerine and Sottas.[7]

Hatschek,[8] in June, 1895, could find no other recorded cases. One of his own presented unilateral symptoms with predominance of the lesion on one side. Oppenheim (1893) can report only one case, and that without autopsy, in which the syringomyelia was extensive in the lower dorsal cord and confined to one posterior horn throughout the cord above, as appeared to be the condition clinically in the case we report. In our case the gliosis extends through the lumbar and sacral regions, although the increase of the patellar reflexes would have indicated that these parts were not involved. It becomes limited to one posterior horn at the first dorsal segment, which explains the absence of all paralysis in the arm, although disturbance of thermal sense and some analgesia were present. We have been able to find some of the spinal lesions described in the case of Rossolimo. The fibres of the right posterior roots entering the right posterior horn are destroyed, the right anterior horn contains fewer fibres in the lower cervical region, and here also the right side of the cord is smaller than the left, noticed especially in the lateral column; but the number of ganglion-cells of the anterior horn is not lessened and the lemniscus is normal on the opposite side. In Rossolimo's case the posterior horn was affected from the tenth or eleventh thoracic roots through the cervical region; this greater extent of destruction may possibly explain the condition of the lemniscus

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[1] v. Lenhossék: Anat. Anz. 1890 Jahrg., v. pp. 360–362.

[2] Ramón y Cajal: Anat. Anz. 1890 Jahrg., v. p. 613.

[3] Van Gehuchten: Anat. Anz. 1893 Jahrg., viii. p. 215.

[4] Gombault and Philippe: loc. cit., p. 553.

[5] Oppenheim: Archiv f. Psych., vol. xxv. p. 317.

[6] Rossolimo: Ibid., vol. xxi.

[7] Dejerine and Sottas: Comptes Rendus des séances de la Société de Biologie, 1892.

[8] Loc. cit., pp. 1155 and 870.

of the opposite side in his case; and yet one would imagine that in a lesion from the first dorsal to the second cervical segment the extent would be sufficient to produce a similar alteration in the lemniscus. In his case he was unable to report the condition of the nuclei of the posterior columns, and these columns in the upper portion of the cord were not entirely free from sclerosis. The lateral column on the same side as the lesion was smaller than that of the other side, as is the condition also in the lower cervical portion in our case; but we must explain this in greater part as due to the ascending sclerosis. Fibres probably ascend in the antero-lateral column to join the lemniscus of the same side at the sensory decussation, but we are not aware of any connection between these and the lemniscus of the opposite side. The theory of Rossolimo, that the degeneration of the lemniscus in his case was due to a presumable alteration of the posterior nuclei, seems most probable.

We have in the microscopic examination a satisfactory explanation of the condition observed in life. The paralysis and contracture of the lower limbs, incontinence of the bladder and rectum, decubitus over the buttocks, absolute loss of cutaneous sensibility in both legs, constricting pains over the chest, are explained by the pachymeningitis and total destruction of the middle and lower portions of the thoracic cord. We find that tactile sensibility began to be normal at the level of the nipple, on the right side, and of the umbilicus on the left, and we have reported that at the second dorsal segment the cavity was almost limited to the right posterior horn; furthermore, it is stated that over the right arm, right shoulder, right side of the neck, the patient failed to recognize the difference between heat and cold, and that some analgesia was present over the right arm. Does not the limitation of the cavity to the right posterior horn prove beyond question the location of fibres for the sense of temperature for a portion of their course within the posterior horns?

A zone of tissue between the extreme median end of the cavity and the central canal was not destroyed; it is possible that fibres for the sensation of pain may be located here, and that in this way the partial analgesia may be explained. Our case shows further that the thermal fibres enter the posterior horn to the outer side of that portion which in the thoracic cord is occupied by the column of Clarke.

In Rossolimo's case we find mention of complete loss of temperature- and pain-sense in the upper extremity corresponding to the side of the cavity. The preservation of tactile sense in the right upper limb, and the presence of a cavity which destroyed the right posterior horn throughout the cervical region, indicate that tactile fibres from the upper extremity probably ascend in the column of Burdach.

# ADHERENT PERICARDIUM AS A CAUSE OF FATAL ENLARGEMENT OF THE HEART.

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The term " adherent pericardium " is used here somewhat arbitrarily to signify complete obliteration of the pericardial sac by organized tissue. Extensive yet not universal adhesion is of less frequent post-mortem occurrence, and in dealing with a number of cases it is desirable that upon this one point they should conform to an exact description.

Adherent pericardium, as is well known, is not necessarily associated with either appreciable alteration of size or embarrassment of the heart. Rarely the heart is atrophied or arrested in growth, apparently strangulated by its fibrous encasement. In most cases the heart is enlarged; but often, besides the adhesion, there is some disease of the cardiac valves or muscle, or of the lungs or kidneys, to which, partly at any rate, the enlargement might be reasonably attributed. In a certain number, however, the adhesion is associated with great hypertrophy and dilatation of the heart for which there is no such possible explanation.

What I have to say concerns the last condition only, and is founded upon a series of nine fatal cases which came under my observation at St. George's Hospital during a period of three years when I was responsible for the clinical records. In seven the post-mortem examination was performed by Dr. Rollerston, to whose careful and valuable notes I am greatly indebted; in the remaining two by myself.

Youth is common to all the nine, the ages ranging from eight to twenty-one years, with an average of slightly over fifteen years.

During the same three years adherent pericardium was found after death in the bodies of twenty-eight other patients dead from various causes, in no instance with great enlargement of the heart referable simply to adhesion. Their ages were mostly over fifteen years, and averaged upward of thirty-six years. In these cases it was not always possible to determine at what age the adhesion had been contracted. In twelve, however, the history is reliable as to the initial mischief; that is to say, the pericarditis having occurred at a later age than puberty. In one of these the myocardium was extensively invaded by fibrous tissue, but in the other eleven there is no reason to suppose that life was materially shortened by the adhesion.

In five the pericarditis occurred in childhood. Four of these five had advanced valvular disease and died at the early ages of thirteen, sixteen, eighteen, and twenty-two years, respectively, with great enlargement of the heart, for which evidently the adhesion was partly responsible. The fifth is the one solitary case in which adhesion certainly contracted in childhood proved ultimately harmless.

Conceding the possibility that fifteen is too late for its average fatality, it is clear that the condition in question presents itself chiefly in later childhood and during the period of adolescence, and that afterward it does not show. Further, pericardial adhesion contracted in adult life is comparatively unimportant, while in children it generally proves fatal at no distant time in association with great enlargement of the heart.

The explanation must be sought in the special character and attendant circumstances of the pericarditis of childhood.

Pericarditis in children, if the very young be excluded, is almost entirely rheumatic, and in this relation a far more serious disease than in adults. It has, in fact, a considerable immediate mortality. It is always accompanied by endocarditis, which, however, is unimportant mechanically—at any rate, for the time—as is also the pericarditis, much fluid effusion being exceptional. In fatal cases, it is true, the pericardial surfaces are stuck together, but rather as the result of the act of dying than the cause of death. The gravity of the affection consists essentially in its profound effect upon the heart itself, and death, when it occurs, is due to failure of the cardiac muscle and dilatation of the ventricles. All this and much more was set forth clearly and for the first time by the late Dr. Sturges in the Lumleian Lectures for 1894. The condition which he describes as active or acute carditis was found to include the great majority of cases of fatal heart-disease in children between the ages of six and twelve years at the hospital in Great Ormond Street. It occurs with lessening frequency during the subsequent years up to the time of puberty, and in adults scarcely at all.

Now in those patients that recover—that is, do not die in the acute stage—the enfeeblement and dilatation of the heart are often severe and prolonged, kept up, it may be, by the recurrent attacks of carditis peculiar to childhood. Meanwhile the pericardial surfaces, already stuck by lymph, become united by organized tissue; and although ultimately the nutrition and vigor of the muscle are completely restored, the heart is fixed in the state of dilatation. Hypertrophy follows, but under circumstances of disadvantage, and compensation is never attained.

The great dilatation which may occur in pericarditis, the opportunity thus afforded for adhesion, and the consequent persistence of the dilatation have been well pointed out by Dr. John Broadbent. In many cases the continuity of the sequence can be established from direct observation. In others, of longer duration, and which have not been observed from the first, the importance of the adhesion is overwhelmingly obvious at the post-mortem examination; but there is no doubt that here also the original mischief was dilatation, the adhesion playing a secondary though necessary part. There is abundant evidence that the mere fact of obliteration of the pericardial cavity around a normal heart is a trivial impediment to its action and excites neither hypertrophy nor dilatation. Thus it is that adhesion following upon non-rheumatic pericarditis, which even in children is attended by little enfeeblement of the heart, proves generally harmless.

Hope was the first to recognize the importance of adherent pericardium as a cause of fatal enlargement of the heart. Of the nature and fatality of the association he was for long the sole, and is even at the present day the leading, exponent. He justly laid stress upon hypertrophy as the result of what he termed the shackling of the heart, and is generally quoted as having taught that the morbid processes took place in the reverse order to that given above—first adhesion, last dilatation. It appears, however, upon attentive perusal of his work that he was aware of the essential fact that the heart is enlarged *ab initio*. The first enlargement was described as hypertrophy, but inflammation was one of the causes of hypertrophy, and the word is not used in a favorable sense, for the muscular substance is spoken of as having been softened by inflammation, dilatation thus taking place the more readily.

Upon this point Hope is not explicit, but he expressly observed that "cases of adhesion terminating in enlargement often hurry to their fatal conclusion with more rapidity than almost any other organic affection of the heart;" and again, "adhesion of the pericardium, which rarely fails to produce hypertrophy with dilatation, is an extremely formidable complication of this malady. It greatly aggravates all the symptoms and accelerates the fatal event. It is not unusual for this to take place within the period of a year, and I have known it occur in nine months." The truth of these observations, so far as they go, is not to be disputed.

A hard and fast distinction is sometimes drawn between external and internal pericardial adhesion—necessary to explain the frequent absence of certain physical signs, but somewhat artificial as regards the circumstances we are considering. Internal adhesions alone around a dilated heart must seriously impede its return to the normal size. The supple and elastic envelope is changed into one of considerable thickness and rigidity which opposes more passive resistance than the heart can exert active force when the muscle begins to recover, and the relaxation of the fibre due to feebleness passes into permanent elongation.

Be this as it may, acute inflammation of the pericardium in children is seldom confined to its inner surface. The outer participating, contracts adhesions to some or all of the parts with which, in the distended state of the sac, it is in contact—the sternum, chest-wall, lungs, structures in the posterior mediastinum, and, perhaps most important of all, a larger surface of the diaphragm than that which forms the normal pericardial floor. Of these, lateral adhesions to the lungs are probably the least embarrassing to the heart, unless, as often happens, the lungs adhere to the chest-wall also. Such matters do not escape the notice of the pathologist, but it may be otherwise with morbid adhesions in front of the heart. Normally the pericardium is loosely attached to the sternum and fifth and sixth left costal cartilages. Pathologically the intimacy of this attachment is a question of degree, and the less degrees are liable to be overlooked under the ordinary post-mortem procedure of removing the sternum before the connections of the heart are examined.

The same procedure is ill calculated to display the full extent of any adhesions there may be of the pleuro-pericardium to the front of the chest, when the lungs being pushed aside the folds of the pleural cavity which overlap the heart are obliterated.

In most of the cases which form the subject of this paper external adhesions were a prominent feature. In some they are not mentioned; but for the reasons given it is probable that they were never entirely absent, and that in general they were more extensive than would appear from the bare records.

Adherent pericardium in children has recently formed the subject of a valuable article by Dr. Theodore Fisher, who concludes that the enlargement of the heart must be referred to the specially virulent qualities of rheumatic pericarditis and not merely to the adhesion, for pericarditis of local origin, as in phthisis or pleurisy, results in adhesion without enlargement. It is certainly true that enlargement seldom results when inflammation has invaded the pericardial sac from without, but the statement requires some reservation. When the pericardium is adherent in connection with chronic pleurisy or the condition known as indurative mediastinitis, it is the rule to find that a certain amount of dilatation and hypertrophy, not confined to the right ventricle, has been induced more or less mechanically by the contracting tissue. Such cases, however, are essentially chronic and have little in common with those under consideration in which enlargement of the heart is the predominant feature throughout.

The most striking change is hypertrophy. The muscle is usually firm, red, and free from fibroid invasion; the weight of the heart always immensely increased, seldom to less than twice, sometimes to more than thrice the normal.

The dilatation, however, though less conspicuous, is the essential mischief. With rare exceptions all the cavities are dilated; but the change is most marked in the ventricles where it begins, and the auricles may practically be disregarded.

To take the simplest case of a child dying early in acute carditis, the condition of the muscle is merely functional failure, unexplained by gross or even microscopic change, and the thin-walled right ventricle suffers most. When the acute stage has been prolonged the myocardium on both sides of the heart is found swollen and infiltrated with inflammatory elements, a state of things from which the thick-walled left ventricle is naturally the last to recover. So it happens that sometimes the one ventricle, sometimes the other, is taken at a greater disadvantage by the adhesion. With the returning vigor of the heart the stronger left with its wider range of movement recovers its freedom to a greater extent than the other; and, upon the whole, no doubt adhesion is more disastrous to the right.

The relative dilatation of the two ventricles is not always exactly apparent from post-mortem descriptions of the heart itself, and allowance has to be made for the final dilatation of the left ventricle which sometimes sets in upon the approach of death, and from which the right, by the very reason of its close attachment to the diaphragm and chest-wall, is in great measure protected.

A better method of estimating the relative efficiency with which the two ventricles have been accustomed to act is to compare the state of the lungs with that of the general venous system. Submitting my nine cases to this examination dropsy was present in all but two, and in these two the liver was nutmegged; that is to say, in every case the right side of the heart had given way. In five this was not due to backward pressure from the left side, for the lungs were free from any sign of chronic congestion; while in four there was either pulmonary apoplexy or well-marked chronic congestion, from which it way be inferred that the chief and probably the primary fault was on the left.

We may yet hesitate to ascribe the failure of the left side entirely to pericardial adhesion, for a complication has to be reckoned with in the invariable presence of some degree of valvular disease. As previously stated, the rheumatic pericarditis of children is always accompanied by endocarditis. The aortic valve usually escapes, the mitral never; and so it necessarily happens that in each of my cases the mitral showed an appreciable departure from health.

The change was of that limited and gradual kind which, if free to pursue its natural course, would end in stenosis. In such cases the valve was particularly described as being shaped like a button-hole or like a funnel. In no instance, however, was the orifice actually stenosed; and in some it was wider than normal. Clinically the blowing murmur of mitral regurgitation was also present. Frequently, also, there was a so-called "presystolic murmur," more or less loud, long, and rough, and otherwise resembling that which occurs in mitral stenosis. There are good reasons for believing that this murmur may correspond to the systole of the ventricle and so to regurgitation, but here it suffices to point out, what has been observed before, that the murmur does not necessarily indicate stenosis.

Regurgitation, and not obstruction, was in every case what occurred, and due more to the pericardial adhesion than to the proper disease of the valve.

The two lesions, in fact, are mutually antagonistic. On the one hand, the development of actual stenosis is prevented by the dilatation of the ventricle and consequent stretching of the mitral orifice; on the other, the free regurgitation which would result from stretching of a healthy valve is moderated by the tendency to stenosis.

As for the diagnosis of adherent pericardium, the only certain physical signs depend upon the heart being so closely connected with the chest-wall or diaphragm that with systole the præcordial parts, or, as Broadbent finds, the lower ribs on either side are pulled inward. Such direct indications are seldom available, but cases of the kind which have been discussed are sufficiently recognizable from a number of circumstances and phenomena, none of which taken alone are conclusive of adhesion.

A history of pericardial friction or of recurrent rheumatism in childhood is highly suggestive, and still more so is the development of immense enlargement of the heart within a short time from the first illness. The præcordium is often unduly prominent and occupied by an impulse which, though both wide and strong, is more particularly characterized by the impression it gives of a curbed and struggling heart. Dropsy, especially in the form of ascites, is of early occurrence; and in spite of the invariable presence of one or more mitral murmurs, the lungs are often entirely unembarrassed. The complexion ranges from a faintly bluish pallor, when the right heart only is at fault, to a leaden but hardly cyanotic hue when the left also fails. Last and most characteristic of all are the rapid progress of the case to its fatal end and the signal failure of all known means of relief in heart-disease.

In conclusion, although there is nothing to say about the treatment of adherent pericardium, a word may be hazarded about that of pericarditis so far as concerns the dilatation of the heart upon which the gravity of adhesion depends. The best authorities are agreed that in the acute stage of pericarditis digitalis is worse than useless, but it does not follow that the heart will not respond to a simpler stimulus. Gaskell, in his classical experiments upon the tonicity of the heart and arteries, found that minute quantities of alkali produce a tonic contraction of normal cardiac muscle indistinguishable from that which occurs with digitalin, and it would seem that this discovery is not without its clinical application. I have watched many cases of pericarditis under alkaline treatment given for a different purpose, and have often observed the heart's action to become calmer and more efficient, and a mitral regurgitant murmur, probably of dynamic more than organic origin, to disappear.

Case I.—A child, named Charlotte D., had a first attack of rheumatism in 1880, and a second, much more severe attack in October, 1885, when she was fifteen years old. In August of the following year she began to suffer from dropsy, and in April, 1887, she was admitted into the hospital for the first time.

The face was pale, the lips faintly cyanotic, and, although the legs were œdematous, the chief dropsy was in the abdomen. The heart was greatly enlarged to the right, with much epigastric pulsation and but little leftward displacement of the apex. A blowing systolic murmur was heard on both sides of the chest, and a short "presystolic" murmur in the apical region. She improved under treatment, which included tapping the abdomen; but during the next three years and a half was readmitted often and with decreasing intervals of relief, always with the same characters of complexion and dropsy. The abdomen was tapped altogether twenty-six times. The heart underwent considerable further enlargement, as shown by the gradual displacement of the apex to a point in the sixth interspace, two inches outside the nipple-line, the murmurs remaining much as before. In October, 1890, pericardial friction was audible for a few days, after which she sank, having now a little bronchitis for the first time, and died in December, at the age of twenty-one.

*Post-mortem:* The pericardium was adherent externally to both lungs, the chest-wall, diaphragm, and posterior mediastinum. The sac was completely obliterated by tissue, which was mostly old and fibrous, though comparatively recent over a limited area posteriorly. The heart weighed thirty-six ounces. The right ventricle was both greatly dilated and hypertrophied, the left described as slightly hypertrophied only. The pulmonary and aortic valves were healthy, the tricuspid dilated and slightly thickened. The segments of the mitral were thickened and rigid, the chordæ tendineæ retracted, the orifices not constricted but shaped like a button-hole. The whole of the left pleural cavity and the back of the right were occupied by old adhesions. The lungs were small, otherwise normal. In the abodmen the most important morbid appearance was thickening of the capsule of the liver, which organ was nutmegged and enlarged, weighing sixty-four ounces.

Case II.—Amelia C., previously healthy, was attacked by rheumatism at the age of fourteen, in June, 1892. Pericarditis developed in the course of July, and was followed by obstinate vomiting. She was admitted into the hospital toward the end of November, complaining chiefly of the vomiting and not yet conscious of any trouble about the heart. The heart, however, was already much enlarged, the apex being in the sixth left interspace, outside the nipple-line, and the area of pulsation extending to the epigastrium. A blowing systolic murmur, preceded at the apex by a knocking first sound, was heard in the mitral area, and a blowing diastolic internal to the nipple. The pulsation grew rapidly more prominent and labored; great œdema of the legs and ascites set in, and at last swelling of the arms from thrombosis of the subclavian veins. She died at the end of December.

*Post-mortem:* The pericardium was adherent externally to both lungs and firmly to the tissues in the superior mediastinum, but not to the sternum or ribs. The two layers were completely united. The heart weighed twenty-five ounces. The left ventricle was both dilated and hypertrophied, the right dilated only. Both tricuspid and mitral valves were dilated. The edges and chordæ tendineæ of the latter were thickened, but the condition was clearly more stretching of the orifice than disease of the valvular structures. The aortic valve showed a few recent vegetations, but appeared competent. The myocardium was healthy. The right lung was slightly œdematous, the left compressed by pleural effusion; no pulmonary apoplexy. Liver nutmegged; spleen and kidneys hard and congested.

CASE III.—Florence H., aged ten years, who first suffered from rheumatism in the summer of 1890, was admitted into the hospital in the following September with acute rheumatism and slight chorea. There was already a blowing mitral murmur, and almost immediately a sharp attack of pericarditis developed, from which she recovered without extreme enlargement of the heart. Subsequently she had much rheumatism and was often readmitted, the heart undergoing progressive enlargement. The blowing murmur was constantly present; sometimes also a so-called "presystolic murmur and apical thrill." Her complexion was always of a leaden color, the veins being evidently full. Dropsy set in in May, 1893, and she died in July, at the age of fourteen, with extreme œdema of all the subcutaneous tissues and much ascites.

*Post mortem:* The heart occupied an enormous part of the left side of the chest, but did not extend far to the right. The pericardium was closely adherent to the sternum by tough fibrous tissue, and firm bands passed from near the apex of the heart to the chest-wall. Between the pleuro-pericardium and each lung were firm bands which appeared to have become stretched since their formation. The two pericardial layers were everywhere closely united and could only be separated by forcible tearing. The heart with the adherent pericardium weighed twenty-one ounces. Both ventricles were greatly hypertrophied, the left dilated also. The aortic valve and those of the right side were healthy. The mitral was funnel-shaped and somewhat thickened, but the orifice was not stenosed, admitting just two fingers. Both lungs were compressed by fluid in the pleuræ; no pulmonary apoplexy. Liver nutmegged, spleen and kidneys cardiac, pancreas extremely indurated.

CASE IV.—John O'B., died in June, 1890, at the age of thirteen years. His illness dated from an attack of rheumatism attended by præcordial pain six months before. He was under observation for the last five weeks of his life, the chief clinical phenomena being a large, laboring heart with a loud systolic blowing murmur; ascites, for which he was tapped; and latterly bronchitis, with duskiness of face but not cyanosis.

*Post mortem:* The pericardium was firmly adherent externally to the trachea and aorta, and internally to the heart. The heart weighed fifteen ounces. The right ventricle was dilated, the left hypertrophied. The mitral orifice was rather large, admitting two fingers loosely; the edges of the valve thickened, retracted, and beaded; the chordæ tendineæ shortened. The muscle of both ventricles was unusually firm, but showed nothing abnormal under the microscope beyond slight increase of fibrous tissue around the bloodvessels. Pleural adhesions on right side; no engorgement of lungs. Liver nutmegged.

CASE V.—Joseph J., previously healthy, had rheumatism in February, 1890, and became dyspnœic and œdematous in October of the same year. He died in November, at the age of eleven years, shortly after admission into the hospital. There was much pulmonary distress, with hæmoptysis, blueness of lips, galloping action of the heart, and bellows mitral murmur.

*Post-mortem :* The pericardium was slightly adherent to the chest-wall and everywhere firmly to the heart. The heart weighed seventeen ounces. Both ventricles were hypertrophied—the right slightly, the left markedly dilated. The mitral edge and chordæ tendineæ were thickened, the orifice hardly dilated. In the septum between the ventricles was a minute perforation, apparently congenital and obviously unimportant, though of interest in connection with the fact that the patient's complexion had always been high colored. Extensive bronchopneumonia and several pulmonary apoplexies. Much dropsy.

Case VI.—Collin B., died in June, 1891, at the age of nineteen years. His health had been very good until November, 1890, when he was attacked by rheumatic fever which confined him to bed for five weeks. The immediate cause of death was pneumonia, but he had suffered from præcordial distress and dyspnœa for two months previously, and the essential disease was undoubtedly that of the heart.

The main cardiac phenomena were a cantering rhythm, knocking first-sound, and blowing apical systolic and rumbling diastolic or presystolic murmurs. At the end the heart's action was very tumultuous. The complexion was conspicuously pallid.

*Post mortem :* The pericardium was not unduly adherent to the sternum or chest-wall. There were fairly recent adhesions to the right lung. The two layers were completely united by firm fibrous tissue. The heart weighed twenty-eight ounces. The left ventricle was dilated and considerably hypertrophied, the right slightly dilated. All the valves showed bead-like vegetations. The mitral segments and anterior chordæ tendineæ were thickened, but the orifice was not contracted. Some of the columnæ carneæ were affected with fatty degeneration ; the rest of the muscle, though pale, showed no fatty or fiboid change under the microscope, and most of the fibres retained their striation. The upper lobe of the right lung was in a state of gray hepatization ; the rest of the lungs œdematous. Liver nutmegged ; no dropsy.

Case VII.—Ellen J. died in February, 1892, at the age of eight years. There was no history of rheumatism, but one of chorea and left hemiplegia (probably embolic) in the summer of 1891. She recovered from both, but only to fail again from shortness of breath at the end of the year. She was now admitted into the hospital with progressive cardiac embarrassment which proved fatal without dropsy. There was extensive pulsation, with a blowing mitral systolic murmur preceded in the apical region by a short rumbling sound and an ill-defined thrill. The complexion was a sickly bluish pallor.

*Post-mortem :* The pericardium was adherent to the sternum and both lungs by firm fibrous tissue. Filamentous fibrous bands existed also between the base of the heart and the upper lobe of the right lung. Internally the pericardium was universally adherent to the heart, for the most part by fibrous tissue, though on the left side was some sanious lymph. The heart weighed sixteen ounces. The right ventricle was dilated, the left both dilated and hypertrophied. The mitral segments were thickened and retracted and the chordæ tendineæ shortened, but the orifice was of normal size. A few vegetations on aortic valve. Both pleural cavities extensively occupied by old adhesions. In lower lobe of right lung a firm patch of congestion resembling an apoplexy in process of absorption. Lower lobe of left lung collapsed. Liver nutmegged.

Case VIII.—Annie B. first had rheumatism at the age of three years, from which time she was known to have heart-disease. A second and very prolonged attack occurred when she was about twelve, and a third three years later. In August, 1890, being now sixteen, she was under treatment for subacute rheumatism; and in November she was readmitted into the hospital, severe præcordial distress and much œdema having developed suddenly. The heart was immensely enlarged, especially on the left, the apex being in the sixth interspace two inches outside the nipple-line. Blowing systolic murmurs were heard in both mitral and tricuspid areas, and occasionally a so-called "presystolic" murmur at the apex, where there was a marked diastolic thrill. She became rapidly worse and died in January, 1891.

*Post-mortem:* The pericardium was considerably thickened and universally adherent to the heart. The left ventricle was much dilated and also considerably hypertrophied, especially the columnæ carneæ; the right very slightly dilated only. The mitral valve was much thickened; it was somewhat wider than natural, admitting three fingers barely, but was stenosed in relation to the size of the ventricle. Right lung engorged; apoplexy at base of left lung.

Case IX.—Ada C., aged twenty years, was admitted in December, 1892. Her health had been good until the end of 1890, when she had an illness which she called "influenza," but which was probably rheumatism. Since then she had suffered from palpitation of the heart. Œdema of the legs first appeared in July, 1892. She was pale, cyanotic, and moderately dropsical, with an extensive cardiac impulse and turbulent action. At the apex, which was in the sixth space and far outside the nipple-line, was an early rough murmur with a thrill ending in a snap and followed by a blowing systolic murmur. She improved and was sent to the Convalescent Hospital at Wimbledon; but the dropsy soon returned, surpassing its former degree, and she was readmitted at St. George's in February, to die a few days later.

*Post-mortem:* The pericardium was universally attached to the heart by organized but not very strong adhesions, and there were filamentous adhesions to the chest-wall. The heart was very large: the left ventricle greatly dilated, the right slightly hypertrophied. The myocardium was healthy. The mitral orifice fairly admitted two fingers, but the edges and chordæ tendineæ were thickened and the segment pulled down into the ventricle, the valve being thus somewhat funnel-shaped. The lower lobe of the left lung was in a state of red hepatization, and the rest of the lungs showed signs of chronic congestion.

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# REVIEWS.

Anatomy, Descriptive and Surgical. By Henry Gray, F.R.S. A new edition, thoroughly revised by American authorities from the thirteenth English edition, edited by T. Pickering Pick, F.R.C.S. With 772 illustrations, many of which are new. Philadelphia and New York: Lea Brothers & Co., 1896.

Gray's *Anatomy* has for a long time been a favorite with students, and for good reasons. The style has been attractive, the illustrations large and clear, it has not aimed too high, and has been essentially practical. These are great recommendations; and as valuable additions and revisions have been made from time to time, it is not surprising that its popularity has held. Anatomists, indeed, have sometimes been inclined to criticise, to point out inaccuracies and crudities, but they have been practically unanimous in maintaining that it is a capital book for the average student. The publishers announce in their note to this new edition that the sections on the teeth and brain have been rewritten by Dr. Bern B. Gallaudet, who has had charge of the general revision; the section on the abdominal viscera, by Dr. Frederick J. Brockway; and that Professor J. Playfair McMurrich has revised the histology and the development.

The book is so well known that we shall limit ourselves to the discussion of these parts, merely remarking in passing that we wish the statements on times at which the union of the later epiphyses and of the parts of the skeleton originally distinct had been revised also; for in our opinion the dates given are in several cases too late, sometimes greatly so. We must say further that the diagram of the plates representing the stress-lines of the upper end of the femur is quite unsatisfactory.

We feel bound in our criticisms to bear in mind the scope of the work; we cannot expect an exhaustive treatise on histology and embryology, but we think the revision of these parts might been more searching. We might expect rather more attention to Golgi's methods, and we should have more and better diagrams of the internal structure of the central nervous system. Two rather serious errors in the account of development of the tongue have escaped notice. We are told that the circumvallate papillæ are situated in the V-shaped groove separating the three original parts of the organ, while in fact they are anterior to it, and we are at a loss to understand how the epithelial covering is derived from the epiblast. The section on the Teeth has been improved and several very useful illustrations added.

We approach the brain with diffidence, for the task of the reviser must have been an appalling one. Beyond question the improvement is great. It seems to us much to be regretted that Dr. Gallaudet did not include the cord and brain in one common scheme, and, beginning with the zones of His, unfold the matter from the starting-point of embryology. He has not ignored this method—he follows it in dealing with the pia and its offshoots—but he has not made it as prominent as we could have wished. The statement in former editions that the choroid plexuses pass through the foramen of Monro has happily disappeared; but the reviser seems to have felt that so venerable an error had to be ejected with a certain semblance of respect, and we are not sure that we are finally rid of it. Of the velum interpositum he says: "Its anterior extremity or *apex* is bifid, each bifurcation lying close to and behind the corresponding anterior pillar of the fornix, and hence 'in,' but covered by epithelium, the foramen of Monro." It seems to us that if the foramen of Monro be simply a constricted portion of the general vesicular structure from which the brain develops, its boundaries must be the epithelium into which its innermost cells are transformed, and that nothing external to this can possibly be "in" the foramen. Many illustrations have been added with great profit.

Dr. Brockway has chosen the developmental method in treating the peritoneum and has succeeded well. The description of that complicated membrane is perhaps as clear as can be expected. We are also much pleased with his description of the abdominal viscera, which is thoroughly up to the times. He gives particular attention to relations and describes them clearly and well. Our only serious criticism of Dr. Brockway's work is the introduction of mere lists of the parts in relation with each organ, which not only is needless after the description, but smacks of the compendium, and is beneath the dignity of the book. He seems so anxious that no relation shall escape him that he admits several that have no claim to be recognized. Thus we see no reason for saying that the posterior surface of the liver is in relation with the tenth and eleventh dorsal vertebræ, when the diaphragm is between them. Some of the illustrations that have been added to this section are particularly valuable.

To sum up, the book is better than ever, and deserves warm commendation. It is so good that we cannot suppress a wish it were still a little better.

T. D.

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## THE PHYSIOLOGY AND PATHOLOGY OF THE CEREBRAL CIRCULATION: AN EXPERIMENTAL RESEARCH. By LEONARD HILL, M.D. Large 8vo., pp. xvi., 208. London: J. & A. Churchill, 1896.

"IN fiction," says Macaulay, in his fine essay on "History," "in fiction the principles are given to find the facts; in history the facts are given to find the principles; and the writer who does not *explain* the phenomena as well as state them performs only one-half of his office. Facts are the mere dross of history. It is from the abstract truth which interpenetrates them and lies latent among them, like gold in the ore, that the mass derives its whole value."

Tested by this standard, the book of Mr. Hill stands at a high level. One of the most dreary tasks we sometimes undertake, but more often shirk, is to look through (we dare not say read through) a book of experiments in which with tiresome iteration and exasperating minuteness all the details of numberless experiments are described, and then the inferences that under certain physiological conditions certain other physiological consequences will ensue. "Very well," we say, "and what if they do?" What necessary consequences follow of which the surgeon, the physician, the obstetrician, the various specialists should take note? What dangers does it help them to avoid? What hints does it give toward the "final cause" for which all doctors exist—the saving of life and the lessening of suffering? And to these questions the book usually gives no answer. In other words, the book is strictly a scientific determination and massing of facts, and in Macaulay's sense this is the mere dross of science.

The author of such a book and of such experiments presumably has reflected much on their relative value, their relation to many other facts already known, their importance in correcting errors of practice and in instituting new methods of treatment. He should, therefore, embody these reflections in such proportions as will set forth their bearing upon these points so that the general medical public, who have not either the time or the patience to follow all the steps in his often weary ascent, shall learn what the prospect is from the top and how their progress should be guided. Not but that all the details must be given for revision by his peers and fellow-workers, but with the milk give us the cream.

Mr. Hill has experimented with minute and painstaking care by many methods and means and drugs upon the various phases of the cerebral circulation. We have only space to refer to one—and a much-neglected one—the effect of gravity upon the circulation. That means to the physician or surgeon the effects of posture—standing, sitting, lying, and the Trendelenburg posture—on the phenomena of the circulation. It means the importance of posture in syncope, in the weakness of diphtheria, in cardiac disease, in dyspnœa, in threatened death—the threat too often ending in reality—from anæsthetics. After a sufficiently full account of his experiments, illustrated by excellent diagrams of the record-curves of pressure, at the end of his chapter he not only summarizes his conclusions from the scientific point of view as the result of the discussion of his experiments on the effects of gravity, but gives us the practical applications derived from his studies.

Thus he has shown that the important duty of compensating for the simple hydrostatic effects of gravity in changes of posture resides in the changes that take place in the abdominal vessels, especially those of the viscera, and hence it is that ordinarily we feel no effects from the change from a recumbent to a vertical position. Ether slowly and to a less degree, and chloroform rapidly and to a much larger degree, destroy this compensation by destroying the splanchnic vascular balance, and then posture is the prime factor in determining life or death; the standing or sitting posture in such a case is most dangerous for the reason just given. Hence chloroform especially should never be given to a patient in the sitting posture. The graphic picture given a few years ago of a rescue from death by chloroform by placing the patient head down—by Marion Sims, if we remember rightly—was no mere dramatic play of the fancy, but a true scientific remedy. The Trendelenburg position is, therefore, of great value, but to too great a degree or too long continued it may overwhelm the heart. Compression of the abdomen best compensates for the vasomotor paralysis produced by chloroform, but the rhythmic alternate compression of the abdomen and the chest is the best remedy in chloroform-poisoning.

We do not wonder at the many deaths from chloroform one sees recorded in European journals. It is given with a carelessness which to most Americans is astonishing, and often "pushed," which, Mr. Hill shows so graphically, is particularly dangerous. Such recommendations as his are needed here, but are especially needed there, and we hope they will be heeded.

Every one of the chapters is replete with such sound applications of the scientific results of his admirable investigations. The book is a small one, only 200 pages, and is printed in large type. Let us hope that it will be printed in still larger type in the mind of every surgeon and every physician. The only fault we can find with it is the use of "parese" as a verb, a liberty which Americans (who are so often accused by our English brethren of unwarranted tampering with their mother-tongue) would not dare to take, and that its few illustrations, apart from pressure-curves, are not up to the standard of the rest of the book. W. W. K.

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FOOD IN HEALTH AND DISEASE. By I. BURNEY YEO, M.D., F.R.C.P., Professor of Therapeutics in King's College, London. Second edition. Pp. viii., 592. Philadelphia and New York: Lea Brothers & Co., 1896.

To those familiar with the first edition we need say nothing. The compact little volume, full of practical suggestions based upon laboratory-work and extended observation, to which are added the logical deductions of the author, has so frequently been of valuable service that no reviewer's criticism can change the position which it occupies in the esteem of the practitioner. The second edition is before us, revised to meet more recent theories and in general presenting the same careful editing which marks all of the works of Yeo. Unlike many books upon this subject, it is eminently practical, readable, and withal scientific. In a book so generally excellent it is difficult to select a portion especially so, but the chapter which seems to be worthy of particular mention is that upon the "Food in Diabetes." Of course, all books upon food must be based upon the work of Parkes, Bauer, Roberts, Dujardin-Beaumetz, Sée, and others; and here the indebtedness is acknowledged. Facts are often for the confusion of the unwary, but the careful study of this work shows that they have not been allowed to lead its author into unprofitable and dangerous conclusions. Even in spite of great care errors are present, fortunately none of great seriousness. We are of the opinion that the marked difference in diastatic capacity between the solid and liquid malt-extracts should have been pointed out (p. 487), the limitation of fluids during the mastication of starchy foods by patients suffering from amylaceous dyspepsia insisted upon, and the foot-note of p. 426 deserves a better position in that it presents a fact known to careful observers long before the method described in the note to Chapter VI. came into vogue. We are disposed to go much further than the author, for we have seen a large number of gouty patients, who had been unsuccessfully treated by the usual methods, rapidly improve and maintain their betterment upon an almost exclusively animal diet. We quite agree with the author (p. 381) in calling attention to fraudulent gluten-bread, the seriousness of the conditions which necessitate its use makes the subject of great importance. We are not of the opinion that large oysters are necessarily coarse, nor that the "native," though small, is delicate (p. 45); nor is coffee, as generally made, an infusion (p. 104); nor that Kola-nut (seed intended) contains thein (p. 109); nor that the author intends to apply the adjective cirrhotic to a kidney (p. 414). For the American edition pounds are preferable to stones as units of body-weight, and the British terminology of certain nouns could have been dispensed with. The book is well up to date, even if its quotations from that curious mixture of good and bad literature, the *Twentieth Century Practice*, were not in evidence. We have read this book with pleasure and profit, and we can conscientiously recommend it as a safe and satisfactory guide for the regulation of "Food in Health and Disease." R. W. W.

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A MANUAL OF MATERIA MEDICA AND PHARMACOLOGY. By DAVID M. R. CULBRETH, Ph.G., M.D., Professor of Botany, Materia Medica, and Pharmacology in the Maryland College of Pharmacy. Pp. xi., 818. Philadelphia and New York: Lea Brothers & Co., 1896.

THIS work treats of all the organic and inorganic drugs which are and have been official in the United States Pharmacopœia, together with important allied species and useful synthetics. We take up the book with considerable reluctance, because, with the great number of works upon this subject, we scarcely hope to find anything new, and the matter admits of but little variety in presentation. After a careful examination we would be remiss in our duty if we did not record our appreciation of the wide reading, the scholarly accuracy, and just perspective which have contributed to make this a manual deserving of high commendation. We like the classification (generally of Bentham and Hooker) of the drugs from the vegetable kingdom; those from the animal kingdom are arranged according to the zoölogic sequence; the inorganic drugs, carbon and synthetic compounds, in chemical relationship. The larger portion of the book is devoted to the drugs of vegetable origin, and while the remainder are by no means passed over in a perfunctory manner, this is satisfactory in a marked degree. If an omission were to be suggested, Part VI., "The Microscope and its Use in Materia Medica," would be better studied in a special treatise. This part is decidedly elementary, and in its practical close (the microscope in the drug-store) too brief. The tables, dose-lists, and abbreviations add to the value of the book for both teacher and student. The illustrations, nearly four hundred and fifty, are to a considerable extent new and eminently satisfactory. Further than this, the indicated pronunciations and derivations—the latter probably in advance of the average student—the synonyms, the short sketches of drug-gathering, and withal the descriptions of the excommunicated members of former editions of the Pharmacopœia are features both unusual and acceptable.

As we look over the record of substances dropped from official recognition we are more than ever at a loss to understand why these and not some of our present accepted drugs were selected. The fact that these, though officially dead, still live in the memory of physicians, is good reason for the historical research of the author. While the industry of the author is remarkable, one must remind him that he has forgotten *lytta vesicatoria*, the old name for *cantharis*. Of errors of statement we note but few. We doubt if the dried leaves of *rhus toxicodendron* are inert (p. 139), since Pfaff has isolated a fixed oil which is probably the irritant. The nomenclature of the Pharmacopœia in general is adhered to; exception noted, *chloral*, not *chloral hydrate* (p. 26 and elsewhere). Rarely do we find variations: sodio-theobromine salicylate (p. 100); theobromine sodio-salicylate (p. 764). The Latinity is excellent, even extending to a recognition that *alvus* is one of the very few feminine nouns in *us* of the second declension (*alvo adstricta*, p. 794); but this makes *spiriti* (p. 19) as the pleural of *spiritus*, a noun of the fourth declension, the more unfortunate. Typographical errors are extremely rare; we note collodiums (p. 18), and an extra "P" (p. x.). We believe that the book is best applied for students of pharmacy and apothecaries, while students of medicine, if well grounded in this, would be thoroughly fitted for the taking up of the application of remedies in the treatment of disease, yet quite likely would consider that the study of the substance was proportionally greater than the study of the uses to which it should be put. Considered as a manual of materia medica, and pharmacology might have been omitted from its title, this book contains the information of an encyclopædia in the compass of a text-book. This book deserves and will occupy a leading position among works upon materia medica, no matter by whom or where produced. R. W. W.

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THE READY-REFERENCE HANDBOOK OF DISEASES OF THE SKIN. By GEORGE THOMAS JACKSON, M.D. With sixty-nine illustrations. Second edition, revised and enlarged. Pp. 594. Philadelphia and New York: Lea Brothers & Co., 1896.

BUT a few years have elapsed since this work first appeared, and its probable acceptance as a valuable addition to the handbook-class on diseases of the skin was clearly intimated by the various reviews. A second revised edition so soon afterward has justified the opinion then expressed. In the present volume the text has been considerably increased and nineteen new illustrations added. New sections on Acromegaly, Actinomycosis, Angina Serpiginosum, Dermatitis Repens, Erythema Induratum, and several other of the rarer diseases, have been introduced. These several changes have all tended to make the book a more complete one. The text is clear, and sufficiently full for a comprehension of the subjects presented.

The subject of treatment is given its share of attention, and includes all the newer methods and remedies of proved value. The author always writes to the point, without a superfluity of words; and we can cordially say has given us in the present volume a thoroughly satisfactory and clear expression of cutaneous diseases. H. W. S.

# PROGRESS

OF

# MEDICAL SCIENCE.

## THERAPEUTICS.

UNDER THE CHARGE OF

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### Ichthyol in Pulmonary Tuberculosis.

Dr. Maurice le Tanneur reports the laboratory-experiments of Latteux, which showed that of nine species of microbes subjected to 3 or 4 per cent. solutions of the drug none has resisted save the streptococcus pyogenes, which, however, succumbed to solutions of 6 to 7 per cent. Fifty patients, taken indiscriminately, and therefore presenting all forms and degrees of tuberculosis, have received doses of from 15 to 90 grains of this drug, increasing 15 grains every two or three days. On account of the disagreeable odor it has been given in 5-grain capsules, from four to twenty-four daily, with meals. It has produced no digestive disturbances; on the contrary, gastric fermentation and diarrhœa have disappeared under its use. It does not produce fever, nor any local nor general reaction. Of local symptoms, cough without expectoration has been markedly relieved, its use being followed by easy expectoration; with the relief of this symptom the heart is rested and the irritability disappears. The expectoration becomes more liquid and the color paler. The dyspnœa is constantly relieved because of the diminution of bronchial congestion, easier expectoration and cardiac rest permitting better and easier pulmonary hæmatosis. Intercostal pain is usually lessened. Its general action is an improvement in strength, increase in weight, diminution of sweating, and accession of appetite.—*Journal de Médecine de Paris*, 1896, No. 32, p. 378.

Dr. Moritz Cohn has used this remedy for about two years without regarding it as a specific for pulmonary tuberculosis. However, it increases the strength of the organism and places it in a position to carry on a successful warfare against the bacilli. The early apical infection is frequently completely cured. In advanced cases the improvement often follows when cod-liver oil and creosote have failed. When cavities exist the high temperature is benefited. It possesses the advantage over cod-liver oil that it can be given in summer as well as in winter, and over creosote that it is harmless in large doses. If the drug fails, other remedies can be used, but with less high anticipations. Naturally, hygienic, dietetic, and climatic treatment should be carried out. For poor people, its cost recommends it. It is administered in from 2 to 50 drops, thrice daily before meals, of the mixture of equal parts of the drug and distilled water, diluted with one to eight ounces of water, followed by black coffee or lemonade. Less efficacious are the pills, each one-sixth of a grain, from three to thirty daily.—*Deutsche medicinische Wochenschrift*, 1896, No. 28, S. 447.

## THE USE OF TUBERCULIN.

DR. PETER KAATZER has treated within the past five years seventy patients suffering from pulmonary tuberculosis. Of these, thirty-one are dead, twenty-one cured, twelve improved, and six unimproved. From this he concludes that (1) when careful individualization is exercised and no complications are present, this treatment is devoid of danger and promises success. (2) The complications (mixed infections) are from the start to be treated by hygienic, dietetic, and climatic measures. (3) The nutrition, so far as the body-weight is in evidence, is, at least, not influenced unfavorably. (4) Through the combination of this with other recognized methods of treatment will the cure of this disease be more rapidly, safely, and pleasantly brought about than was formerly the case. (5) Treatment in institutions which are, from a climatic point of view, favorably situated adds to the certainty of the results. (6) The rejection of this method is not a just position to assume.—*Therapeutische Monatshefte*, 1896, Heft 8, S. 446.

## COLD AIR IN THE TREATMENT OF PHTHISIS.

DR. EDWARD PLAYTER, noting the benefit which was obtained by sleeping with a bedroom-window open all night near the head of the bed, has required his patients to follow this plan, sometimes with a fire in the room morning and evening, and sometimes during the night for ventilation. He believes that very few cases in the first stage, or even in the early part of the second, can long resist without improvement, and, indeed, ultimate, practical recovery, the invigorating effects of prolonged, constant breathing of an atmosphere flowing over a snow-covered expanse of country. An apparatus is in process of construction consisting of a coil of pipe in an ice and salt chamber, for rendering cold the pure air of the warm season, for respiration in these cases by means of a tube and valved mouth-piece. It is believed that this will give better results than any medicated inhalant, or a serum, antitoxin, or manufactured substance whatever that can be administered by subcutaneous injection or in any other way.—*American Medico-Surgical Bulletin*, 1896, No. 16, p. 446.

## THE TREATMENT OF PNEUMONIA AND BRONCHO-PNEUMONIA BY PHENOCREOSOTE-INHALATIONS.

M. L. VÉRET presents three formulas: (1) water, 500, carbolic acid, 2; alcohol, 2; creosote, 1; with sufficient alcohol to keep the creosote in solution. If this is not well borne, then use (2) creosote, 30; glycerin, 100; alcohol, 10; carbolic acid, 10; 95 per cent. alcohol, 260; filtered water to 1000. This does not make a clear solution unless it is shaken immediately before using. To obviate this difficulty the following formula was devised, to which an equal quantity of water is added when it is required for use: (3) creosote, 15; carbolic acid, 5; alcohol, 5; glycerin, 50; 95 per cent. alcohol, 200. The apparatus employed is that of Championnière. The patient is placed at the side of the bed upon either his right or left side, the head so placed that he receives the spray upon his nose and mouth, but not in such a position that his respiration is embarrassed, and protected by a waterproof sheet. The inhalations should be continued for ten minutes at least six times in the twenty-four hours. Neither dyspnœa nor hæmoptysis is a contraindication. —*Archives de Médecine et de Pharmacie militaire*, 1896, No. 9, p. 158.

## THE SALICYLATES IN THE TREATMENT OF HÆMOPTYSIS.

DR. THOMAS J. MAYS notes that this symptom occurs in patients suffering from the rheumatic or gouty diathesis, of which a history may be obtained by careful questioning. Two instances are reported. The formula presented is: sodium salicylate, 4; potassium acetate, 1; tincture of digitalis, 3; wintergreen water to 32; of which a teaspoonful is given four or five times daily. So far from a natural antagonism existing between rheumatism and pulmonary tuberculosis, the author believes that the two diseases are mutual friends and that one paves the way for the development of the other, and that it is common to find both not only prevailing in the same family, but in the same person.—*The Philadelphia Polyclinic*, 1896, No. 43, p. 421.

## THE TREATMENT OF RESPIRATORY DISEASES BY WARM BATHS.

DR. E. LEMOINE makes use of baths of a temperature of 96.8° to 100.4° F. The tub should be large enough for the child to be immersed to his neck in order that local chilling may be avoided. To prevent congestion of the face and head, which is readily produced during a warm bath, especially in those suffering from fever, a folded napkin, wet in cold water, is placed upon the head and renewed as often as it becomes warm. The duration of the bath should be about ten minutes, rarely more. If the child is feeble, its pulse should be carefully watched in order to avoid syncope. If necessary, a teaspoonful of stimulant or a dose of caffeine may be administered before the bath. As soon as it is finished the patient is wrapped in a woollen blanket, rapidly rubbed, and left to sleep well wrapped up in bed for a half-hour. After this a woollen shirt is put on, in which he remains until the next bath. Baths with mustard are valuable on account of their revulsive action, and are prepared by placing eight ounces of powdered mustard in cold water in the tub, which is subsequently filled with warm water. The cold compresses to the head are, in these baths, imperatively necessary. The bath should be continued until the skin is rose-tinted. An inconvenience is the painful nasal and ocular irritation of both patient and assistants, which may be obviated by placing a sheet, through which the head of the patient emerges, over the tub. During eight years sixty-three patients have been treated without a death—fifty-five children and eight adults. Of the children there were of simple bronchitis, 9; capillary bronchitis, 5; lobar pneumonia, 3; broncho-pneumonia, 38. Of the adults there were of pneumonia, 3; severe grippal congestion, 3; general bronchitis, 2 cases. From these baths the revulsion which is obtained affects the whole body, carrying the blood to the surface far more effectually than any local application. Auscultation shows that the râles are larger, more plentiful, and the mucus becomes more fluid, and in the case of pneumonia the affected lobules more permeable to air.—*Journal des Praticiens*, 1896, No. 39, p. 612.

### The Use of Antitoxin Accompanied by a Convulsion.

Dr. Alfred King reports that a spinster of thirty-seven years received an injection of antitoxin [number of units not stated] into the subcutaneous tissues between the right scapula and spine. Two injections of eighteen minims each had been made, when the patient was found with her eyes wide open, eyeballs rolled upward and outward, and twitching slightly; the muscles of the face were working; a slight noise accompanied a superficial, irregular, spasmodic respiration; there was a spasmodic condition of the entire body. The pulse was very slow, irregular, and variable in force; some beats could hardly be felt. The pulse was growing feebler, when suddenly all of her muscles became relaxed, her breathing stopped, and she appeared to be lifeless. After artificial respiration she began to breathe and consciousness returned. The antitoxin was about eight months old.—*Boston Medical and Surgical Journal*, 1896, vol. cxxxv. p. 309.

### A Specific for Dysentery.

Mr. A. Punusawmy Pillay claims that a dessertspoonful of peeled garlic boiled in a wineglassful of cow's milk and made into a jelly, which should be sweetened with a little sugar, and administered to adult patients every two hours, will give relief. For chronic cases a teaspoonful of finely powdered cinnamon-bark, together with half a teaspoonful of cloves and one-quarter teaspoonful of nutmeg, should be added to the jelly, mixed with a little butter, if possible, and taken three times a day. The diet should be a farinaceous one with milk. No explanation is offered in support of the claim that this is an infallible cure.—*Indian Medical Record*, 1896, No. 5, p. 189.

### Salol in Diarrhœa.

Dr. M. H. Fussell suggests the following formula: salol, 1; bismuth subnitrate, 2; chalk-mixture to 24; of this two drachms (for adult) are to be taken every two hours until relieved. Salol gives better results when mixed with a slight astringent. He concludes that: (1) Diarrhœa due to dietetic errors is well controlled by this mixture. (2) Opium is rarely necessary when salol is given. (3) Salol controls the abdominal pain equally as well as opium. (4) It is perfectly safe, having no bad after-effects. (5) It is especially useful in the diarrhœa of children. (6) It is of no value in dysentery. (7) It certainly corrects the fetor of the stools. (8) In the diarrhœa of typhoid fever it acts almost as a specific.—*Therapeutic Gazette*, 1896, No. 8, p. 525.

# MEDICINE.

UNDER THE CHARGE OF

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## Lactic Acid in the Stomach.

Dr. R. Stern thus sums up the present status of our knowledge of lactic acid in the stomach: 1. For clinical purposes Uffelmann's test, especially with the modification of Kelling or Strauss, is sufficient if made after an Ewald breakfast. If necessary, the stomach must be washed out before the breakfast is taken. The use of food free from lactic acid (Boas's method), and of complicated tests, is not necessary in practice. 2. Under ordinary circumstances lactic acid cannot be demonstrated by Uffelmann's test after the Ewald breakfast. Marked reduction of the hydrochloric acid, stagnation and perhaps also diminished absorption, are necessary for the production of lactic acid. 3. These conditions are fulfilled most frequently in cancer of the stomach. In most cases of this disease lactic acid is produced in large quantities, and in doubtful cases this fact may be of diagnostic value. But lactic acid is not a specific sign of gastric cancer; it may be absent in this, and may occur occasionally in other diseases in which the conditions are favorable.—*Fortschritte der Med.*, 1896, No. 15.

## Autodigestion of the Pancreas.

Chiari (*Zeitschrift für Heilkunde*, 1896, Bd. xvi. p. 70) makes an important contribution to the study of the pancreas. His attention was called to the subject by observing, in two cases, circumscribed necrotic foci in the pancreas which did not seem due to vascular disease or to disseminated pancreatitis, and in which bacteria could not be found. In both cases there were evidences of reactive changes around the necrotic areas, indicating that the processes must have begun some time before death. Chiari therefore examined the pancreas in seventy-five cases with reference to the suspected autodigestion. He found that in eleven cases there was total necrosis of the connective tissue, the nuclei staining faintly or not at all, and the protoplasm being homogeneous. In twenty-nine cases there was disseminated necrosis of the acini and connective tissue. In the other thirty-five cases there was no necrosis. As neither decomposition nor previous disease could be adduced as the cause, it follows that the process was one of autodigestion. The conditions in the pancreas are analogous to those in the stomach, but it must be left to future researches to show why the pancreas does not always digest itself, and why in the case of circumscribed necrosis during life the pancreatic tissue is not broken down and absorbed.

### Sugar in Pathological Fluids.

Pascheles publishes some results tending to alter our usual idea as to sugar in pathological fluids, viz., that except in diabetics traces of sugar only are present, if any, unless the fluid contains chyle. Pascheles determined the quantity of sugar in thirty cases, in pleural exudates, ascitic fluid, hydrocele fluid, and the contents of cantharides-blisters. Fehling's titration-method was used; polarization and the phenyl-hydracin test were applied occasionally. He found the average quantity of sugar in seven pleural exudates to be 0.082 per cent.; in ascites without congestion, 0.093 per cent.; ascites with congestion, 0.118 per cent. The minimum, 0.042 per cent., was found in two pleural exudates; the maximum, 0.163 per cent., in a recent ascites. High and low proportions occasionally occurred in both pleural and ascitic fluid. No difference could be observed relative to the amount of sugar in transudates and exudates, nor was there any essential difference in this respect in serous and chylous effusions.—*Wiener klin. Wochenschrift*, 1896, No. 17.

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### Secondary Tumor of the Heart.

Kayserlink (*Centralblatt für inn. Med.*, 1896, No. 32) recently reported a case in which during life the heart was enlarged; there was marked fremitus beside the apex-beat and over the base of the heart; there was tenderness on pressure in the level of the third dorsal vertebra. The case seemed one of aneurism, but the fact that the patient was much emaciated, and the existence of severe pain in the breast and arm raised doubts. Suddenly paraplegia occurred, followed by decubitus and cystitis, after which the pain in the breast and arm disappeared. Post-mortem effusion in the pericardium was revealed, with a tumor in the auricles. There was also a tumor, probably primary, in the hilum of the left lung, following the course of the main bronchus, and metastases in the second and third dorsal vertebræ. The collapse of the latter had caused compression of the cord. The tumor proved to be a lymphosarcoma.

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### Erythromelalgia in Women.

As erythromelalgia affects men more frequently than women, two cases reported by Pajor )*Pester med.-chir. Presse*, 1896, No. 3) are of interest. In one case the patient was a governess, twenty-nine years of age. The symptoms, which followed taking cold six years before, recurred at longer or shorter intervals. Severe pain, redness and swelling of the toes and heels, the pains radiating from the toes to the thighs, alternate with periods of complete relief. Baths, massage, cold-packs, ichthyol, antipyrin, iron, and arsenic were followed by only temporary improvement. The attacks occur sometimes during menstruation, and then small painful spots appear in the mouth and on the tongue, disappearing temporarily, but recurring with greater intensity. In the second case, the wife of a workman, thirty-five years of age, the disease began two years ago in the right middle finger, later affecting both hands. Redness, pain, and swelling appear at intervals. The nails are split and discolored. The author considers the pathology of the disease at length, and concludes it is a peripheral neurosis. The trophic disturbances in the second case he attributes to a peripheral neuralgia.

## LUMBAR PUNCTURE WITHOUT RESULT.

FÜRBRINGER reports an interesting case bearing on the fact sometimes observed that in lumbar puncture no fluid is evacuated, though the needle is evidently in the lumbar sac. It has been thought by some that in such cases there was some fault in the performance of the operation. Fürbringer had under his observation a five-months-old child with tense and prominent fontanelles and severe opisthotonos. Lumbar puncture was made fourteen times without getting a drop of fluid, even with the aid of aspiration. The child died on the day of admission. Autopsy showed tuberculosis at the base of the brain with great dilatation of the ventricles. The whole base of the brain was converted into a gelatinous and very œdematous mass, continuous with a similar mass along the anterior and posterior surfaces of the cord, filling the dura. The gelatinous material was studded with miliary tubercles. All the punctures had penetrated the dura, without injuring the cauda. Puncture was evidently negative because there was no fluid, and not because the needle passed to the side of the dura or because it was too narrow. —*Deutsche med. Wochenschrift*, 1895, No. 45.

## GOUTY HEART.

TH. SCHOTT (*Berlin. klin. Wochenschrift*, 1896, Nos. 21 und 23) is a firm believer in the existence of gouty affections of the heart, though admitting that these are less rarely observed in pure cases of gout than in the irregular forms. In the concretions in sclerosed aortic valves urates can sometimes be demonstrated by the murexid-reaction, along with calcium phosphate and carbonate. More frequently gout causes valvular lesions indirectly as the result of sclerotic changes, but in this process other factors, such as abuse of alcohol or tobacco, lues, or overeating, assist. Gout is more prone to cause motor and sensory cardiac neuroses. Beginning with palpitation, soon followed by tachycardia, dilatation of the ventricles develops with all its consequences. The sensory disturbances vary from mild, pricking pain in the region of the apex or more severe radiating pains to paroxysmal pain, with tenderness on pressure over the sternum or the base of the heart. The latter condition is often associated with symptoms of heart-weakness and can lead to angina pectoris. The prognosis in pure cases, not too far advanced, is good under proper treatment.

## ANATOMICAL CHANGES IN THE BRAIN IN CHRONIC INSANITY.

FEIST (*Virchow's Archiv*, Bd. 138, p. 443) has examined the central nervous system in four paranoiacs, all women, three of them above the age of fifty years. In one case the posterior columns of the cord showed a peculiar punctate and mesh-like growth in the neuroglia. This appearance Feist thinks is due to degenerated axis-cylinders. There was also a small neuroma on the left dorsal nerve. In another case there was ascending degeneration of the posterior root of the sixth cervical nerve on the right side, ganglion-cells of the lateral horn in the white matter, and hyperplasia of the neuroglia in the posterior columns. The third case showed disappearance of fibres in the gray matter of the cord, a small focus probably due to sclerosed vessels in the right anterior horn at the level of the sixth cervical nerve, degeneration of the white matter, especially in the posterior columns and posterior roots, and atrophy of the cortex of the brain. In the fourth case there were hyaline areas in the gray matter of the cord, degeneration of the posterior columns of varying degree, and an abnormal origin of some posterior root-fibres of the right ninth dorsal nerve. The most constant change was in the posterior columns, in the form of degeneration of the nerve-fibres, and diffuse hyperplasia of the neuroglia. Feist believes that these changes have some as yet unexplained connection with chronic paranoia. Perhaps they explain the anæsthesia and indifference to traumatism, inflammation, etc., so common in such cases, at least better than the idea that the insane delusions of the patients prevent reaction to such irritation.

### PHLEGMONOUS GASTRITIS.

The difficulty of recognizing this condition is well illustrated by two cases observed in the same hospital in St. Petersburg (*Vratch*, 1895, Nos. 32, 33, 34, and 36). The first case, reported by CHANUTIN, recovered. The patient was a woman, twenty-six years of age. The disease began with nausea, vomiting, and temporary diarrhœa. Pain in the epigastrium, frequent vomiting, especially after taking solid food, then began. Chills came on irregularly; the temperature reached 102.2° F. After six weeks the patient vomited yellow, purulent, and fetid material, soon followed by vomiting of blood. The abdomen was retracted. The epigastrium and left hypochondrium were extremely tender, and pressure there caused nausea and vomiting. The spleen was enlarged. Microscopic examination of the vomitus showed many pus-corpuscles and bacteriological examination gave an almost pure culture of staphylococci with a few streptococci. The reaction of the stomach-contents was at first alkaline, later acid. Free hydrochloric acid could be found in it only once. Nothing could be retained in the stomach but ice-pills. These, ice externally, occasional injections of morphine, and nutrient enemata, constituted the treatment under which the patient gradually recovered. From an analysis of this and cases previously reported the author gives the following as the symptoms of phlegmonous gastritis: chills, high temperature, frequent pulse, frequent sweats, the typhoid state, bilious vomiting, with pus-corpuscles or pure pus; pain of a burning, boring, or pulling character in the stomach-region; constipation or diarrhœa; tenderness in the gastric region; at times a tumor.

DÖRBECK, however, saw a case in which the conditions were by no means so clear. The patient was a woman of sixty-three years, admitted on account of headache, fever, chills, coryza, cough, and pain in the limbs. The tongue was coated, the pharynx was red, the tonsils swollen, there was herpes nasalis. The spleen was somewhat enlarged; there was no vomiting, no diarrhœa; the lungs and heart negative. The temperature was 104° F., pulse 112, respiration 30. The abdomen was not distended, but was somewhat tender. The diagnosis was influenza. On the third day bronchitis and diarrhœa came on.

The next day the abdomen became somewhat distended and tender. With increasing general and cardiac weakness death occurred. Autopsy showed superficial ulceration on the mucous membrane of the right half of the stomach with extensive thickening of the deeper layers of the stomach-wall. The mucosa was partially detached from the deeper layers by pus. The process was most marked in the serosa, and extended to the peritoneum, which also contained pus. The pus in the submucosa contained many streptococci. —*Centralblatt für inn. Med.*, 1896, No. 40.

## SURGERY.

UNDER THE CHARGE OF

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### SIR JOSEPH LISTER'S RECENT COMMENT ON THE PRESENT STATUS OF WOUND-TREATMENT.

In his recent Presidential Address upon the "Independence of Science and the Healing Art," delivered before the British Association for the Advancement of Science (*Lancet*, London, 1896, No. 3812), SIR JOSEPH LISTER alluded briefly to the part that he took in the development of the methods at present employed in the treatment of wounds. He recalled the behavior of wounds before the introduction of antiseptics into surgical practice, and in a few words referred to the successive steps in the evolution of the principles he has so industriously labored to establish.

After speaking of his demonstration of the harmlessness of the atmospheric dust in surgical operations, he says: "This conclusion has been justified by subsequent experience; the irritation of the wound by antiseptic irrigation and washing may, therefore, now be avoided, and nature left quite undisturbed to carry out her best methods of repair, while the surgeon may conduct his operations as simply as in former days, provided always that, deeply impressed with the tremendous importance of his object, inspiring the same conviction in all his assistants, he vigilantly maintains from first to last, with a care that, once learned, becomes instinctive, but for the want of which nothing else can compensate, the use of the simple means which will suffice to exclude from the wound the coarser forms of septic impurity. Even our earlier and ruder methods of carrying out the antiseptic principle soon produced a wonderful change in my surgical wards in the Glasgow Royal Infirmary, which, from being some of the most unhealthy in the kingdom, became, as I believe I may say without exaggeration, the healthiest in the world; while other wards, separated from mine only by a passage a few feet broad, where former modes of treatment were for a while continued, retained their former insalubrity. This result, I need hardly remark, was not in any degree due to special skill on my part, but simply to the strenuous endeavor to carry out strictly what seemed to me a principle of supreme importance. Equally striking changes were afterward witnessed in other institutions. Of these I may give one example. In the great Allgemeines Krankenhaus of Munich hospital-gangrene had become more and more rife from year to year, till at length the frightful condition was reached that 80 per cent. of all wounds became affected by it. It is only just to the memory of Professor von Nussbaum, then the head of that establishment, to say that he had done his utmost to check this frightful scourge; and that the evil was not caused by anything peculiar in his management was shown by the fact that in a private hospital under his care there was no unusual unhealthiness. The larger institution seemed to have become hopelessly infected, and the city authorities were contemplating its demolition and reconstruction. Under these circumstances Professor von Nussbaum despatched his chief assistant, Dr. Lindpaintner, to Edinburgh, where I at that time occupied the chair of clinical surgery, to learn the details of the antiseptic system as we then practised it. He remained until he had entirely mastered them, and after his return all the cases were on a certain day dressed on our plan. From that day forward not a single case of hospital-gangrene occurred in the Krankenhaus. The fearful disease pyæmia likewise disappeared, and erysipelas soon followed its example. But it was by no means only in removing the unhealthiness of hospitals that the antiseptic system showed its benefits. Inflammation being suppressed with attendant pain, fever, and wasting discharge, the sufferings of the patient were, of course, immensely lessened; rapid primary union being now the rule, convalescence was correspondingly curtailed; while, as regards safety and the essential nature of the mode of repair, it became a matter of indifference whether the wound had clean-cut surfaces which could be closely approximated, or whether the injury inflicted had been such as to cause destruction of tissue. And operations which had been regarded from time immemorial as unjustifiable were adopted with complete safety. It pleases me to think that there is an ever-increasing number of practitioners throughout the world to whom this will not appear the language of exaggeration."

## THE TREATMENT OF TRAUMATIC LESIONS OF THE KIDNEY.

In a careful study of this subject KEEN advances the following conclusions as regards wounds of the kidney inflicted by weapons other than gunshot (*Annals of Surgery*, 1896, vol. xxiv. No. 2):

1. The usual external disinfection should be scrupulously carried out.
2. Both for examination and for the arrest of hemorrhage the primary wound should be enlarged if necessary. The kidney itself should be examined with great care, and it and the entire interior of the wound disinfected.
3. All hemorrhage should be arrested, of course, as quickly as possible.

4. If the kidney is unwounded, a temporary drain may be placed in the wound and the greater part of it closed.

5. If the kidney is wounded also, this wound should be sutured or a partial nephrectomy be done, followed by drainage and partial closure of the wound.

6. If the pelvis be opened, it should be sutured, if possible, and the wound drained.

7. If the large vessels are cut, or the kidney itself is lacerated beyond the point at which it would probably retain its vitality and recover its function, immediate nephrectomy should be done.

8. If in spite of disinfection, as a result of the primary wound, perinephritic abscess should follow, this should be widely opened and thoroughly drained, and if the kidney be hopelessly involved, or the condition of the patient so serious as to demand it, secondary nephrectomy should be done.

9. If the peritoneal cavity has been entered by the vulnerating body, carrying infection in its course, and all the more if other viscera be involved, abdominal section should be done at once, the kidney treated as above indicated, and other lesions remedied."

Of gunshot-wounds he says: "If the surgeon has reasonable evidence that the kidney has been probably traversed by a ball (and all the more so if it is certain that it has been wounded), and the patient is evidently in grave danger, as shown by the general symptoms of internal hemorrhage and by the physical signs of a large lumbar hæmatoma or of intraperitoneal bleeding, I take it for granted that all of us would recommend an exploratory operation with a view to determine the extent of the injury to the kidney and the proper treatment."

In the rare cases in which the injury appears to be limited to the kidney the lumbar incision is to be preferred; while if there is a probability that other abdominal viscera have been injured, the kidney should be approached through an abdominal incision. The first thing that should be done is to secure the arrest of hemorrhage. The proper disposition of the kidney will then depend upon the extent to which it has been injured.

The author has prepared a table of 118 cases of rupture of the kidney recorded since 1878. Of these, 67 recovered and 50 died, a mortality of 42.7 per cent. Seventeen of the fatal cases were of such a nature that treatment was either impossible or futile. Dr. Keen therefore bases his conclusions on 100 cases, 33 of which died, a mortality of 33 per cent. Among these were 13 early deaths, 11 from shock and hemorrhage, and 2 from peritonitis in addition, and 10 late deaths, all from septic causes except 2, who died, one from continuous and the other from secondary hemorrhage. The author thinks that if nephrectomy had been performed in these 23 cases, 10 of them would have recovered. This would have reduced the mortality to 23 per cent.

The paper shows conclusively that the dangers of rupture of the kidney are hemorrhage and sepsis.

The duty of the surgeon then seems clear. Where the symptoms are threatening, especially if there be marked evidence of hemorrhage or probable danger of sepsis, an exploratory operation should be done immediately. Whether nephrectomy should be done is to be determined by the conditions already stated. It is especially to be noticed that the great mass of recoveries in rupture are the slighter cases; the graver ones do not recover, unless an operation is done. In any case, therefore, with severe or dangerous symptoms, the surgeon should lean toward exploration, and in severe laceration toward early nephrectomy. It will add a little to the risk and will probably save a considerable proportion of lives.

## Preliminary Resection of the Fifth Costal Cartilage in Order to Approach the Pericardium.

Durand (*Revue de Chirurgie*, 1896, No. 6) recommends this method of reaching the pericardium in operations on this structure. This operation was first suggested by Ollier. Some writers advise the resection of the sixth cartilage also, but Durand has found the space afforded by removal of the fifth entirely sufficient.

The author recommends the resection of the fifth cartilage preliminary to simple aspiration. He lays stress on the chance of serious injury from a puncture even with a small needle through an intercostal space, as the operator does not know where his needle is going. The operation has its chief indication, however, in performing pericardotomy for purulent pericarditis.

The chief difficulty in the operation is the costo-mediastinal cul-de-sac in separating the sternal end of the cartilage. In the tuberculous the cartilage may be very adherent. In those who have had no inflammatory affection of the lungs the procedure is simple. In some cases the recognition of the pericardium will be difficult. The perichondrium is to be removed with the cartilage.

Technique: 1. The incision is made on the fifth costal cartilage, parallel to it, and from 6 to 8 cm. long. It should commence in the median line. 2. Rapid denudation of the cartilage by a bistoury. 3. Resection of the cartilage by separating the sternal attachment and lifting from behind forward. Durand adds ligature of the mammary vessels. Secondary ulceration or accidental perforation are thus provided against. The fingers then loosen the triangularis sterni.

The border of the sternum may be removed by the gouge if more space is required.

## Observations on the Pathology of Enlarged or Hypertrophied Prostate.

Harrison (*The British Medical Journal*, December 28, 1895) regards senile enlargement of the prostate as an example of a muscular hypertrophy analogous to other similar kinds of overgrowth, and arising out of the muscular functions in which the part is unceasingly engaged. The author continues in the paper a study of the structure of the muscles, and wishes to prove that the prostate, in connection with its associated parts, has an arrangement and muscular function which are not sufficiently recognized; that its hypertrophy is to be regarded as a provision against structural dilapidations in adjacent parts, arising for the most part out of senile degenerations; that these changes are mainly compensatory, while in others they are hurtful and excessive; that in the latter respects it resembles the provisional hypertrophies.

## The Suturing of Arterial Wounds.

In July, 1895, Gluck reported to the Berlin Medical Society the suturing of an arterial wall in an arteriovenous aneurism. HEIDENHAIN (*Centralblatt für Chirurgie*, 1895, No. 49) reports a case in which, during the removal of a carcinoma of the breast, the axillary artery was wounded. The edges of the wound were caught with hæmostatic forceps and a continuous suture of catgut introduced with needles, such as are used in inserting intestinal sutures. The wound was packed and not closed until the end of forty-eight hours, when all danger of secondary hemorrhage seemed to be passed. The case recovered completely, and there was no evidence of a traumatic aneurism when the author examined the patient six months later. The author advises the use of catgut, such as is used for ligatures, and the union of endothelium to endothelium; sometimes there is a slight oozing through the stitch-wounds after the suture is completed, but packing for a few minutes will stop it. He does not believe it is necessary to heal the wound by secondary suture, as the healing of the tissues about the artery tends to support it.

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## The Treatment of Artificial Anus by Primary Incision into the Peritoneal Cavity.

In the treatment of the artificial anus by operative procedure great difficulty is encountered in preserving aseptic conditions in the peritoneal cavity and gaining a knowledge of the exact position and the amount of adhesions which bind the intestines together.

To overcome these difficulties GANGOLPHE (*Revue de Chirurg.*, April, 1896) advises the following method of operating: the abdominal parietes surrounding the artificial anus are incised down to the peritoneum, isolating the anus and surrounding area. The incision embraces the skin and subcutaneous tissues solely. At the upper angle of the incision the cut is deepened so that it includes the peritoneum and admits the passage of the exploratory finger within the abdominal cavity. After a careful examination of the conditions present, curved scissors are passed along the finger and the entire incision is completed. The anus thus freed is drawn outside, surrounded by aseptic pads, and the intestine united by the most suitable method of enterorrhaphy. The intestine is then returned to the abdominal cavity and the parietes closed by a suitable method of suture, as in laparotomy.

The author claims the following advantages for this method:

1. It is rapid. The surgeon is in no danger of wounding any portion of the intestines, and can go immediately into the peritoneal cavity.

2. It is sure. The finger introduced in the cavity explores beforehand, and then guides the scissors, which cut free the artificial anus without endangering the remaining intestines.

3. It permits of the drawing out of the entire mass upon sterilized compresses, where the principal part of the operation can be done leisurely and with easy access. This insures asepsis and diminishes the chance of infection.

4. It is applicable in all cases, and produces success in cases that were formerly unsuccessful.

# OTOLOGY.

UNDER THE CHARGE OF

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## Gangrene of the Ear and Face.

Peck (*Archives of Pediatrics*, vol. xiii. No. 4) reports a case of gangrene of the external ear and face on the left side, occurring in a child of one year affected with severe pertussis. Death occurred on the sixteenth day. The necropsy showed the existence of an abscess between the bone and periosteum in the middle fossa of the cranium, on the left side. [It is probable that the cough in this case forced septic matter from the nasopharynx into the middle ear and set up there an otitis media. This finally developed into a panotitis, spreading outwardly to the external ear and face and inwardly to the middle cranial fossa.]

## Influence of a Sojourn at the Seashore upon Affections of the Nose, Throat, and Ears.

Lavrand (*Arch. internat. de Lar., Rhin., et Otol.*, vol. viii. No. 6) has found that residence in the cold regions of the northern French and Belgian seacoasts gives good results in the treatment of chronic affections of the ear, nose, and throat, excepting (1) in those in which the ear suppurates either constantly or with intermissions; (2) in sclerosis of the middle ear with tinnitus; (3) in affections of the nose and throat in individuals subject to tuberculous or arthritic laryngeal congestions.

## Attico-mastoid Trepanation for Relief of Cholesteatoma of the Temporal Bone. Death from Cerebellar Abscess.

Andérodias (*Arch. internat. de Laryn.*, etc., vol. viii. No. 6) reports the case of a man, aged thirty-two years, affected with otorrhœa for three years. Fifteen days before he was seen by the author he suffered violent pain in the plane of the occiput. A probe passed into the drum-cavity entered a large bone-cavity, from which, finally, pearly masses of offensive odor were syringed. Removal of the outer wall of the mastoid exposed a cholesteatomatous mass. Curetting the cavity was followed by facial paralysis. Two days later the patient was attacked with vomiting and vertigo, and in two weeks he died after short coma.

Death was said to be due to an abscess in the right lobe of the cerebellum, the diagnosis of abscess being based on the intense headache, without rise in temperature, and the diagnosis of the seat of the lesion upon the vertigo, the vomitings, in the absence of special symptoms of meningitis, and upon the fact that at the time of the operation there was detected a perforation of the posterior wall of the mastoid antrum, exposing the lateral sinus, the well-known pathway of infection of the cerebellum in suppurative otitis.

## OTITIC THROMBOSIS OF THE TRANSVERSE SINUS.

GRADENIGO (*Ann. des Mal. de l'Oreille*, etc., vol. xxii. No. 7, review) draws attention to the fact that though surgical treatment of intracranial complications of purulent otitis media is well established, the diagnosis of these lesions is not so easily made. He then gives notes of three cases. In the first, a man aged fifty-nine years, the autopsy revealed thrombosis of the left transverse sinus, with infiltration of pus beneath the pia mater and a purulent nidus in the cerebellum at the base of the left hemisphere, near the medulla. During life there were no symptoms indicative of the presence of the cerebellar abscess. He thinks that in the presence of a thrombosis of the sinus the cerebellum should be explored. In the second case, a woman, of fifty-five years, the subject of chronic otorrhœa for twelve years, complained for some days of pain in the side of the head corresponding to the affected ear. Suddenly she became unconscious, and showed signs of collapse. In two days she died. The autopsy revealed hemorrhagic pachymeningitis, thrombosis of the right lateral sinus, and extradural abscess. Infection had been propagated to the cranial cavity through the perforated and carious tegmen tympani and also through the sigmoid sinus. In the third case, a man aged thirty-seven years, acute purulent otitis media was followed in a month by mastoiditis and a subperiosteal abscess, which had lasted a week, when antrectomy was performed. The patient grew worse, and the transverse sinus was opened by the trepan. The thrombus found in the sinus was removed, the wound tamponed with iodoform-gauze, and recovery ensued. In this last case the only symptoms were fever and nuchal rigidity. There were no chills and fulness of the superficial veins of the neck.

## LATENT OTITIC ABSCESS OF THE CEREBELLUM.

MONNIER (*Arch. internat. de Laryng.*, etc., vol. viii. No. 6), after an unsuccessful operation for the relief of the above-named otitic lesion, concludes :

1. When, after a trepanation followed by amelioration, cerebral symptoms again set in, but without phenomena of localization in the cerebral hemispheres, the surgeon must then seek for pus in the region of the cerebellum.
2. The opening in the bone in such a case ought to be made posteriorly, so as to explore the lateral sinus.
3. The opening should be carried downward also, so as to favor drainage after the cerebellum is directed downward in dorsal decubitus.

## GENERAL STREPTOCOCCIC INFECTION WITH ACUTE SUPPURATIVE OTITIS MEDIA. DEATH.

THOMAS (*Rev. Archiv f. Ohrenh.*, vol. xli. part 1) reports the case of a child, seventeen months old, who was attacked with fever, sore-throat, apparently tonsillitis sinistra, and swelling of the submaxillary and cervical glands on both sides. On the third day acute suppurative otitis media was developed on the left side. The fever continued, however, notwithstanding free discharge from the ear and improved local symptoms. A retropharyngeal abscess on the right was then discovered, with general pharyngitis, acute purulent inflammation of the nares and nasopharynx, an eruption of a scarlatinoid erythema on various parts of the body, disturbed respiration, pseudo-membranous enteritis, numerous metastatic abscesses, with gangrenous degeneration of some of them and pneumonic infarcta. Death occurred on the forty-first day of the disease from meningitis, which had run an intermittent course. Bacteriological examination of the pus from the ear revealed the presence of streptococci, chiefly, and also of the staphylococcus pyogenes aureus. The disease was regarded by the physician in charge as originally streptococcic infection.

## Carcinoma of the Temporal Bone.

Danziger (*Archiv f. Ohrenh.*, vol. xli.) reports two cases of this rare malady:

The first case was that of an unmarried woman, aged fifty-four years, who had suffered from chronic otorrhœa in the left ear, the result of scarlet fever in her tenth year. The ear-disease had never received any treatment. The hearing grew gradually worse, and finally a sensation of fulness in the ear became permanent, and severe pains shot from the ear toward the top of the head and the occiput. Danziger found, upon examination of the ear, about 1 cm. from the meatus externus, a tumor filling the entire canal. The surface of the growth was ulcerated and bled upon being touched with a probe. Further examination revealed the fact that the tumor had a broad base and completely filled the drum-cavity. The membrana tympani and the ossicles had been destroyed by disease. The bone in the fundus of the ear was everywhere carious, the mastoid not tender to pressure, but about its point there were some enlarged glands. Microscopic examinations of portions of the tumor revealed its nature to be alveolar sarcoma. In three months, with symptoms of profound cachexia and marasmus, death occurred. The post-mortem examination revealed the fact that the growth had extended inward toward the cerebellum. The dura mater over the central part of the posterior surface of the temporal bone was dark blue and elevated, but not broken through. The tumor had caused absorption of the bone at this point and protruded into the posterior cranial region, as above stated. The sinus was uninjured, but it was adherent to the tumor. Inward the latter reached as far as the jugular foramen, embracing the glosso-pharyngeal nerve.

The second case was that of a man, aged fifty years, syphilitic, but never before affected with ear-disease. His statements were that in the winter of 1893 and 1894 he had had a severe attack of influenza, after which he noted for the first time a tumefaction behind the ear and also one in front of the ear, which latter was "treated with salves and massage." The tumor in front of the ear grew rapidly, and it was removed by operation in Leipsic. About a year later the patient applied to Danziger for relief from "closure of the auditory canal." Further and immediate operation was advised for the removal of the growth, which had evidently developed in the deeper part of the ear. But the patient delayed for six months to submit to any operation. Finally the entire auricle was removed and all soft tissues down to the temporal muscle dissected away over a surface 4 to 5 cm. in width. In two months, however, the growth reappeared and the patient rapidly failed. Sensory aphasia and involuntary escape of urine and feces manifested themselves in the course of two or three weeks, and finally meningitic symptoms for two or three days preceded death.

This also proved to be an alveolar sarcoma, which had eroded the major portion of the temporal bone, destroyed the dura over an area of 5 cm. in diameter, and, attaining the size of an apple, pressed upon the speech-centres in the left temporal lobe, with which it had become adherent.

[If anything can be done to save such cases, it must be a radical operation at the outset of the disease.]

# DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

UNDER THE CHARGE OF

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## Pelliculous Sore-throat.

Every now and then cases are seen which present the physical aspects of diphtheria, but which are really other forms of pelliculous sore-throat which are sure to deceive the careless and occasionally deceive even the expert observer.

Under the heading of "Angine Couenneuse a Streptocoques," Dr. M. A. Gouguenheim reported to the Société médicale des hôpitaux of France (*Annales des Maladies de l'Oreille, du Larynx*, etc., October, 1896) an instance of this character.

A man, about forty-five years of age, was sent by his physician, with a diagnosis of diphtheritic sore-throat, to be tracheotomized on account of suddenly developed violent dyspnœa. When the patient arrived his dyspnœa had quieted and the throat was very easily examined. The left side of the soft palate and the left tonsil were covered with an extensive, continuous grayish-white exudation, presenting the aspect of a true diphtheritic false membrane. The rest of the throat was very red. Laryngoscopic inspection revealed a certain quantity of muco-purulent liquid, but the mucous membrane, slightly tumefied and injected, did not present any false membrane on its surface.

The bacteriological examination of false membrane removed from the soft palate and the tonsil, and of the liquids in the larynx, failed to reveal the bacillus of diphtheria in any of the cultures made from these various regions. Nothing was encountered but the chains of streptococci, absolutely pure and without admixture.

The dyspnœa soon disappeared completely and the voice became normal. Nevertheless, the patient did not improve, and the fever continued constant. Serious complications ensued in connection with the pleura, the left lung and the articulation of the left clavicle with the adjoining bone. At the same time the urine revealed the presence of a notable quantity of albumin.

At the moment when the patient seemed entering upon convalescence, the fever and the albumin disappearing little by little, he was suddenly carried off in an instant by cardiac symptoms which the autopsy showed to be due to a purulent pericarditis, the existence of which had not been suspected during the life of the patient. In addition to this pericarditis, the autopsy revealed pulmonary congestion, from apparent vestiges of the purulent pleura of the left side, and of pus in the articulations of the left clavicle.

A complete record of the case, and of the autopsy, is appended to the article.

### ACUTE RHINOPHARYNGITIS.

PROF. J. LEWIS SMITH, of New York, contributes (*Medical News*, August 29, 1896) a very useful and timely article upon acute nasopharyngeal inflammation, the increase in the frequency and severity of which during the last half of the century he fully recognizes and appreciates, and which he attributes in great measure to the presence of diphtheria and influenza, which were less prevalent previously. The principal causes he assigns are: "Taking cold," as in the ordinary non-microbic form of the malady; further, the presence of chemical or finely divided mechanical irritants present in the atmosphere of large cities, and fragmentary and animal and vegetable materials in the atmosphere of both city and country; but the most frequent cause is assigned to the prevalence of influenza, the minute bacilli of which are able to penetrate into the accessory tubes, sinuses, and anfractuosities connected with the rhinopharyngeal tract, to a greater extent probably than any other pathogenic germ.

Inasmuch as a large proportion of these cases of rhinopharyngeal inflammation are microbic in origin, aseptic sprays or inhalations are recommended at hourly or half-hourly intervals from the very first, with such other appropriate treatment as may from time to time be indicated. Moist air should be maintained, and this may be medicated in warm weather by saturating towels from time to time with suitable solutions, such as oil of eucalyptus and carbolic acid, of each one part to eight parts of oil of turpentine, or, in cool weather, throwing an ounce of the mixture upon two quarts of water contained in a shallow vessel and simmering at a temperature of 170° to 190° F.

Several formulas are recommended for use in sprays: mixtures of aqueous solutions of boric acid and borax, borax and salt, and creosoted alkaline and antiseptic solutions.

### ATROPHIC RHINITIS.

DR. W. PEYRE PORCHER, of Charleston, S. C., reports (*New York Medical Journal*, 1896, No. 926) a case of atrophic rhinitis which, after failure under several methods of treatment, was very much benefited by daily packing between the upper turbinate and the roof of the nose, and allowing to remain there for twenty-four hours, a cotton tampon saturated with a solution in glycerin of iodine 40 grains and potassium iodide 2½ drachms to the ounce. This produced profuse lachrymation and supersecretion, so that the scabs were forced from their old location and became collected in the lower meatus, whence they were blown out.

[It may not be well known to rhinologists that any remedy that produces profuse lachrymation is of great assistance in cleansing the nasal passages in atrophic rhinitis. Women with this disease are always much better after a good cry, whether produced by drugs or by emotion. Indeed, there is a treatment, possibly founded upon the knowledge of this circumstance, consisting in dropping oleaginous solutions into the nasal passages by instillation through the lachrymal duct.]

### ENORMOUS SEQUESTRA IN THE NASAL FOSSÆ RESISTING EFFORTS OF EXTRACTION THROUGH THE NATURAL PASSAGES, AND, AFTER RESISTING ROUGE'S OPERATION FOR DETACHING THE NOSE AND TURNING IT UPWARD, SUCCESSFULLY REMOVED AFTER OLLIER'S OPERATION OF TURNING THE NOSE DOWNWARD.

The above title represents the essential features of this case reported by DRS. E. ROCHARD and A. GOUGUENHEIM (*Annales des Maladies de l'Oreille, du Larynx*, etc., October, 1896).

A syphilitic female, thirty-three years of age, with nasal obstruction on the left side, and without deformity of the face and nose, came under the care of Dr. Gouguenheim, who found a hard, black tumor entirely obliterating the left nasal fossa. Despite the antecedents of the patient her general condition was so good that the possibility was entertained of the tumor being a rhinolith. Every effort to remove it in mass or piecemeal having failed, the operation of Rouge was performed by M. Ripault, one of the Doctor's assistants, but nothing beyond very insignificant fragments could be detached. After recovery from this operative procedure the patient was transferred to the services of Dr. Rochard, one of the surgeons of the hospital, who performed a temporary resection of the nose downward over the mouth, after the method of Ollier. This access freely permitted digital exploration and ready removal of the necrosed bones, which were two large, thick, irregular sequestra presenting no resemblance to any of the osseous portions of the nasal fossæ. Recovery was prompt, and only a slight cicatrix marked the line of incision. The appearance of the parts was so nearly natural that it was impossible to tell whence these sequestra could have originated.

[This case reminds the compiler of one which he reported to the Pathological Society of Philadelphia many years ago, in which he removed, after crushing them within the nasal passages, sequestra representing necrosed portions of the superior maxillary and other bones, which, when placed together, formed an almost complete skeleton of a considerable portion of the nasal passages, and yet the reproduction of bone had been so thorough that it was difficult to believe that these bones had actually been extracted from the living subject.]

### NASOPHARYNGEAL FIBROMATA.

DR. CHARLES M. SHIELDS, of Virginia, read a paper on this subject (*New York Medical Journal*, 1896, No. 928) and reported two cases: one in a young man, twenty-three years of age, and the other in a negro woman, forty-eight years of age. The age, the sex, and the color in this latter patient are all unusual, and make this case unique.

Dr. Shields inclines to the opinion, which has been gaining ground of late years, that few, if any, of these tumors cannot be extirpated through the natural passages and managed with better results than by external surgery after preliminary resection of the upper jaw.

### Gunshot-wound of the Pharynx.

Dr. D. N. Rankin, of Allegheny, Pa., reports (*New York Medical Journal*, 1896, No. 928) a very peculiar case. The patient was shot on May 6, 1847, a bullet going in on the right side about two inches below the lobe of the ear, and coming out on the left side directly opposite the entrance.

Dr. Rankin saw the patient on October 10, 1894, that is to say, more than forty-seven years later. He observed two cicatrices—one on each side of the neck about two inches below the lobes of the ears. Upon looking into the throat, he found two round cicatrices corresponding to the external ones, situated behind and a little below the tonsils, and between them a cicatricial line connecting them and running directly across the posterior wall of the pharynx. This line was so superficial that the ball in its course must have nearly touched the submucous tissue of the parts involved.

### Diseases of the Maxillary Sinus.

In a paper upon "Methods of Diagnosticating Diseases of the Antrum of Highmore, and their Treatment," Dr. Frank S. Milbury, of Brooklyn, N. Y., reports (*New York Medical Journal*, 1896, No. 933), among other cases, one of a merchant, fifty-four years of age, who was afflicted with a carcinoma in the sinus, which, when first seen by the Doctor, presented much of the physical features encountered in ordinary cases of suppuration of the sinus. There was fetid mucopurulent secretion, with polypi extending into the pharynx posteriorly, while the whole antral area of the left side was in deep shadow under electric illumination in the mouth.

The delicate health of the patient induced the Doctor to postpone any operative procedures, and in a few days evidence of the real nature of the malady began to become apparent in a sore over the socket of the second superior left bicuspid, where that tooth had been extracted some weeks previously. Within twenty-five days the case terminated fatally.

The diagnosis of carcinoma was confirmed by the pathologist of Harvard, after a microscopic examination of a portion of the growth excised for that purpose.

### Tuberculosis of the Larynx.

In a paper by Dr. Solomon Solis-Cohen on "Some New Topical Agents in the Treatment of Tuberculosis of the Larynx" (*New York Medical Journal*, October 24, 1896) he discusses the merits of bromoform, formaldehyd, guaiacol, and protonuclein. Formaldehyd is especially extolled, the percentage employed being 1, 2, 4, 6, 8, and 10, respectively, of formalin, formal, or the commercial formaldehyd. Thorough cocainization is required before making the application, which is always irritant to the mucous membrane. 4 per cent. solution of cocaine is sufficient for the weaker applications, but the stronger ones may require even 20 per cent. of cocaine. The parts are thoroughly rubbed with the medicament, and applications are made about twice weekly. In the intervals the larynx may be cleansed with a spray of hydrogen dioxide followed by insufflations of iodoform or protonuclein once or twice daily.

A few cases are narrated in support of the merits claimed for this treatment.

### Perichondritis of the Larynx.

Dr. H. S. Birkett, of Montreal, reports (*New York Medical Journal*, 1896, No. 929) a case of acute perichondritis involving the left crico-arytenoid joint occurring during an attack of gonorrhœal rheumatism.

## DERMATOLOGY.

UNDER THE CHARGE OF

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### The Significance of the So called Epidermis-spirals.

As the result of their investigation of these structures Herxheimer and Müller arrive at the following conclusions (*Archiv für Dermatologie und Syphilis*, xxxvi. Bd., 1 and 2 Heft): a part of the spirals represents shrunken cell-contours produced artificially by the various agents employed in the Weigert fibrin-staining method; a part, especially that previously described as tuft-like, is identical with the protoplasm-fibres of the epithelium. The expression protoplasm-fibres is used to indicate fibres which traverse the protoplasm. Whether these are to be regarded as differentiated protoplasm in the same sense as the fat of the fat-cells, or the pigment of the pigment-cells, is not determined.

### Tuberculosis and Diseases of the Skin.

In a paper presented at the Third International Congress of Dermatology and Syphilis (*Annales de Dermatologie et de Syphiligraphie*, 1896, Nos. 8, 9) Hallopeau discussed the relationship between tuberculosis and diseases of the skin other than lupus vulgaris. The tuberculous nature of any cutaneous affection may be affirmed from the presence of any one of the four following characteristics: (1) The possibility of transmitting tuberculosis by the serial inoculation of morbid products; (2) The presence of the characteristic bacilli in the affected tissue; (3) Intrainoculation—*i. e.*, the production of a dermatosis by the proliferation of alterations clearly tuberculous, and, reciprocally, the production of tuberculosis consecutively to the development of this dermatosis; (4) The appearance of differentiated eruptions, such as lichen scrofulosorum, under the influence of inoculations of tuberculin.

The diversity of form which cutaneous tuberculosis presents is to be explained by the complex structure of the skin; the various ways in which the individual, under the influence of heredity or acquired peculiarities, reacts under the influence of tuberculous infection; age, and, finally, the form under which the infectious agent presents itself. This agent is most commonly a bacillus identical with that of Koch. This bacillus may be modified, however, so that it has little tendency to multiply, and is with difficulty inoculable. While the bacilli can, without doubt, act mechanically, yet it is through the intermediation of the toxins which they produce that their action is to be explained. In all probability the infectious agent of tuberculosis may present itself under a form distinct from the bacillus.

The non-bacillary forms of cutaneous tuberculosis are distinguished by their destructive, invading character, and by the production of toxins which diffuse themselves throughout the greater part of the integument and produce there a special reaction; by not being heteroinoculable; and by presenting a structure distinct from that of other tuberculous lesions. The pathogenic toxins may proceed from foci remote from the regions in which they are localized. The dermatoses due to toxins are distinguished by their occurrence in those attacked by tuberculosis, by not being of a destructive character, by readily yielding to treatment, and by not being heteroinoculable.

The forms of cutaneous tuberculosis due to bacilli are lupus sclereux (Vidal) or tuberculosis verrucosa (Riehl and Paltauf), anatomical tubercle, tuberculous gumma, tuberculous tumor, tuberculous ulcer, suppurative tuberculoses. Those probably produced by a microbic form distinct from the ordinary bacillus are lupus erythematosus and lupus pernio. As due to toxins emanating from distant foci are to be considered lichen scrofulosorum, acne cachectica, isolated or agminate folliculitis in plaques extending eccentrically, papulovesicular tuberculoses, tuberculous erythemata.

Among diseases which find in tuberculosis a favorable soil for their development may be mentioned pityriasis versicolor, pityriasis rubra, and, perhaps, some forms of eczema.

In the treatment of cutaneous tuberculosis ablation and cauterization are the most efficacious methods.

### Influence of Acute Specific Diseases on Leprosy.

P. E. Todd (*Brit. Med. Journ.*, June 20, 1896), who is medical officer in charge of the Leper Institution, Robben Island, Cape of Good Hope, publishes information designed to show what influence certain acute specific diseases may have upon the course of leprosy. Of the lepers who contracted erysipelas, seven died of this disease; 36 per cent. of those who contracted it were worse afterward, and in 64 per cent. there was no improvement. Of the lepers who contracted measles, 12 per cent. were rendered worse; there was no improvement in 68 per cent., and temporary improvement in 12 per cent. Measles being a disease of childhood, and the average age of commencement of first symptoms of leprosy being found to be among 645 patients twenty-six years, one would expect to find few lepers affected with measles. But all doubtful cases of measles were eliminated, only those being accepted in which it was clearly shown that an epidemic existed at the time in the locality where the patient lived. A large number of tubercular lepers are in all leprous countries affected with pulmonary tuberculosis, and the death-rate from this disease is a high one. After a patient becomes affected it can be noticed that the facial infiltration due to leprosy diminishes very considerably. Syphilis exists in the same individual side by side with leprosy, and the features of either disease do not appear to be materially changed. It is noteworthy that potassium iodide in particular exercises an injurious effect upon leprosy. It is unscientific to describe a syphilitic form of leprosy; one might as well describe a syphilitic measles. [The result of Dr. Todd's observations, which are set forth in tabular form, is that, in spite of the statements made in Dr. Impey's recent work on leprosy, no real improvement is to be looked for in lepers by the contraction of erysipelas, measles, or syphilis; and he thus confirms the experience of many other observers familiar with the course of leprosy.]

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### Micro-organisms and Diseases of the Skin.

In an introductory address delivered at the annual meeting of the Dermatological Society of Great Britain and Ireland (*British Journal of Dermatology*, July, 1896), Payne discusses the relationship of micro-organisms to the etiology of diseases of the skin. Certain species of micrococci are found in suppurative diseases of the skin, and are without doubt the cause of the suppuration. They are also found in other diseases which are suppurative only secondarily, as, impetiginous eczema, pustular scabies. It must be remembered, however, that these staphylococci often exist as saprophytes on various parts of the skin, and in any case of staphylococcia it is a question whether the cocci were previously present or were introduced from without. On certain parts of the skin bacteria are much more abundant than on others; chief of these is the hairy scalp, especially if scurfy. These do not necessarily produce any pathogenic effect, but they may be a source of infection for wounds. An evidence of the pathogenic properties of scurf containing micrococci is the frequency of suppurative affections, such as pustular acne, pustules on the neck, and boils on the face, the nape of the neck, the shoulders in connection with seborrhœic conditions of the scalp. Other situations in which bacteria are especially plentiful are the feet, perineum, scrotum, and adjacent parts. The origin of impetigo may be explained by the gradual evolution of virulence in cocci which at first exist upon the skin as saprophytes.

As to the *rôle* which bacteria play in eczema, it may be observed that certain clinical features of the disease may be explained as due to certain bacteria in the same sense as impetigo is due to staphylococci; due, that is, to saprophytic organisms which, in consequence of some preliminary disturbance of nutrition, acquire pathogenic properties. The author thinks the hypothesis plausible that there are some microbes present on the skin which, when their activity is heightened by some trauma or disturbance of nutrition, may produce eczema. In one important point eczema and impetigo are analogous—namely, in starting from certain centres where bacteria abound, viz., the scalp, the feet, and the region of the genitalia. Concerning the pathogenic importance of the various micro-organisms found by Unna and others, and claimed by them to stand in a causal relationship to the eczema, no opinion is expressed.

### The Polymorphous Erythemata.

In concluding a paper upon this subject, Von During (*Archiv für Dermatologie und Syphilis,* xxxv Band, 2 u. 3 Heft) distinguishes three fundamentally different groups: 1. General infectious diseases with symptomatic skin affection. (*a*) The erythema exsudativum multiforme of Hebra. (*b*) Erythema nodosum. 2. Angioneuroses. To these belong a large series of urticarial or maculo-papular affections which resemble the above-mentioned infectious diseases. In this group the question of individual disposition must be considered. 3. The erythematous eruptions produced through embolism. Very many of the so-called "malignant polymorphous erythemata," and secondary skin metastases occurring mostly in septic processes, belong here.

### An Unusual Case of Dermatitis Herpetiformis.

Liddell reports (*British Journal of Dermatology*, October, 1896) a case of dermatitis herpetiformis similar to the case recently published by Hallopeau in the *Atlas of the St. Louis Hospital*, to which he has given the appellation of "en cocarde." The patient was a woman, fifty-three years of age, who a year before coming under the reporter's observation suffered from an eruption preceded by pains in the knees. This eruption consisted of blebs situated upon the legs, abdomen, and back, fresh ones coming out from time to time. A scab formed upon the blebs, which soon dropped off, leaving a ring at the margin of the bleb. This condition continued until the end of the year, when the eruption ceased to appear. In the following year the disease returned, and at this time the patient came under the author's observation. On examination the eruption was seen to be situated upon the thighs, legs, dorsum of the feet, the lower part of the abdominal wall, extending as high as the umbilicus, and on the back as high as the tenth rib. It consisted of rings, gyrate figures, and vesicles and blebs, and was accompanied by itching and burning. The eruption developed in the following manner: vesicles and blebs, measuring from one line to three-quarters of an inch in diameter, first occurred. These were hemispherical or oval, tense, with clear contents becoming opaque in a few hours. Simultaneously with the occurrence of opacity a reddish-pink areola appeared around the lesions. Within twenty-four hours the contents were absorbed, a thin scab formed, but the areola remained. A depressed, shallow, moist ring now formed at the periphery of the scab, between it and the red areola. The outer margin of this ring was soon elevated into a series of elongated vesicles. When the scab was cast off, another ring formed internal to the moist one above described; this ring was foliaceous in character, being composed of fine scales. These rings increased in diameter, and as they grew they coalesced at the points of contact with other rings, forming gyrate figures. On examining the contents of fresh bullæ microscopically numerous micrococci were found, which stained readily with Kuhne's methylene-blue These micrococci were more abundant in fresh bullæ than in those in which opacity had occurred. The patient's general health was good.

## OBSTETRICS.

UNDER THE CHARGE OF

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### The Causation and Treatment of Secondary Puerperal Hemorrhage.

At the last meeting of the British Medical Association this topic was considered at length by Routh (*British Medical Journal*, October 24, 1896). Hemorrhage is called "secondary" when it occurs after the physician has thought it prudent to leave the case. It may be concealed or external. Its causes are sudden relaxation of the uterus from emotion or fright; partial detachment of a piece of retained placenta; detachment of thrombi by exertion, or sudden giving of ergot; loosening a retained piece of placenta. Ergot given before the birth of the child to an exhausted patient causes irregular contraction of the uterus, with spasm of the contraction-ring, and the retention of clots. Blood would be retained, and severe internal hemorrhage might follow. In such cases the treatment is to give ergot by hypodermic, dilate the uterus with the hand, empty it, and secure contraction with bimanual manipulation. A hot douche at 118° F. was also advised. In severe external hemorrhage before the third day the uterus should be explored for pieces of placenta. They should be loosened with the finger, removed, and the uterus packed with gauze. If necessary, bougies or dilators must be employed to open the womb.

In discussion, Van Someren had succeeded in a desperate case by compressing the abdominal aorta. Ritchie gave tincture of nux vomica in large doses, and for some weeks before labor, where a hemorrhagic tendency existed. The placenta and membranes were examined to see that nothing was left behind. He had used a crystal of ammonia-iron-alum, inserted into the os uteri, for bleeding, followed by hot douches. **Byers** had known a distended bladder to give rise to bleeding some days after delivery. **Donald** drew attention to a class of cases in which, after a normal labor on the eighth or ninth day, the patient was seized with a chill, rise of pulse and temperature, and hemorrhage. This resulted from the absorption of fecal matter. Calomel and salines caused a speedy cure. **Williams** had met two cases; one at the end of the first week, in which sudden bleeding occurred; it ceased, to return two or three days later. In one, a small piece of placenta was found, and in the other a small fibroid tumor lay loose in the uterine cavity. Bleeding stopped when they were removed. The hemorrhage, however, was so severe that intravenous injection of salines was demanded. **Kerr** had seen such hemorrhage in cases of backward displacement of the uterus. He did not think that rapid emptying of the uterus caused hemorrhage, as it was not observed after Cæsarean section and precipitate labor. He thought that a too early resort to Crédé's method of expelling the placenta had much to do with causing bleeding. The physician should wait until the placenta had become separated from its attachment to the uterus. **Murdoch Cameron**, in serious bleeding, trusted to tamponing and uterine massage. He also had found benefit from the use of the curette and antiseptic douche. In conclusion, **Routh** had found rectal injection of several pints of saline solution very useful. He was glad to find that injections of iron had been entirely abandoned.

## Antistreptococcus-serum in Puerperal Fever.

**McKerron** (*Ibid.*) describes three cases of puerperal septic infection in which injections of serum were made. The first was a multipara who had fever at the beginning of the second week. The uterus was large and soft, and a chill shortly afterward occurred. Serum was used in doses of 10 cm. A gradual fall of temperature occurred, and the patient recovered; three injections were given.

The second case was that of a multipara who had a chill the second day after delivery. She had a bright rash upon the chest; she had high temperature, abdominal distention, and scanty lochia. Four injections were given without avail. The third case was a multipara attended by a midwife; the labor a breech-presentation. On the fourth day after confinement headache and fever developed, and eight days after confinement serum was injected. Three injections were administered, causing pain and tenderness in the arm with an extensive erythema. Although the patient was threatened with inflammation of the breast, she ultimately recovered.

## The Indications for Treatment in Asphyxia of the Newborn.

In the *Centralblatt für Gynäkologie*, 1896, No. 37, **Schultze** draws attention to two conditions requiring treatment in asphyxia of the newborn, in which different methods of treatment are indicated and in which it is most important that a differential diagnosis be made. In the first condition the child is blue, its heart is beating, and but a mild stimulation of its skin-reflexes is required to bring about respiration. Sprinkling the chest with cold water is quite sufficient in most of these cases to cause efforts at breathing.

In the second class of cases the asphyxia is profound, and the medulla has become so paralyzed that its powers of reflex stimulation are wellnigh exhausted. The most efficient method of rousing this nervous centre consists in rhythmical alterations in the vascular tension of the great vessels and the heart. This is best brought about by swinging the child by Schultze's well-known method for eight to ten times at intervals of one minute, and afterward placing the child in a warm bath. Schultze thinks that the employment of this method produces quite as much result by varying the vascular tension as it does by forcing air into the chest.

### VAGINAL CÆSAREAN SECTION.

DÜHRSSEN, in a Berlin thesis, 1896, reports the case of a patient who had had vaginal fixation of the uterus, and who could not be spontaneously delivered in labor. The operation consisted in opening the vault of the vagina and the uterus, performing version and extraction. Mother and child recovered, the puerperal period being but little longer than the usual one. The operation consists in enlarging the vagina, if necessary, by perineal incision, freeing the uterus from the tissues about the cervix, rapid incision of the posterior and anterior lips of the cervix as high as the internal os, followed by version and extraction. After the removal of the placenta the uterus is pulled down, tamponed, and the lines of incision sutured. If indications for removal of the uterus exist, this can be performed with facility.

### HEMORRHAGIC MALARIAL FEVER IN PREGNANT WOMEN.

In the *New Orleans Medical and Surgical Journal*, October, 1896, SIMMONS reports three cases of malarial fever complicating pregnancy. The first was that of a woman in the sixth month of her first pregnancy. She had bloody urine, fever, and yellow skin and conjunctivæ. As quinine produced no improvement, calomel was given, followed by Fowler's solution and digitalis. The patient recovered and was delivered of a healthy child at term. The second case was that of a woman, nineteen years of age, in her first pregnancy, who had very pronounced symptoms of malarial poison. The patient improved until the uterus suddenly expelled its contents. The child was dead, and the mother perished soon after from shock. The third case was that of a multipara in whom strong uterine contractions were present. She was given morphine, followed by calomel, arsenic, digitalis, and quinine. She recovered from the poisoning, and was delivered of a healthy child at term. It is found that quinine is useful only in those most acute cases where the stomach is tolerant and the kidneys act freely.

### STREPTOCOCCIC PUERPERAL INFECTION; INJECTION OF SERUM; RECOVERY.

REDDY, in the *Montreal Medical Journal*, September, 1896, reports the case of a woman, aged twenty years, a primipara, who became septic after labor. An enlarged vein at the inner site of the left labia was the only abnormal condition present at labor. This vein had burst, and a whitish membrane occupied its site. An examination of this membrane was made, and abundant streptococci and staphylococci were found. Ten cubic c.cm. of Marmorek's serum were injected, followed by the disappearance of the membrane and fall in the temperature. Hæmaturia developed, of a severe character. In forty-eight hours after the injection the temperature had fallen to normal, where it remained. Blood continued in the urine for several days, but the patient made a good recovery. Protonuclein was also administered during the illness.

## GYNECOLOGY.

UNDER THE CHARGE OF

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### Metrorrhagia after the Climacteric.

Masse (*Revue internat. de méd. et de chir. prat.*, 1896, No. 6) calls attention to the fact, previously pointed out by Monod, that uterine hemorrhages may occur after the menopause in perfectly healthy women. These have been noted particularly in stout subjects. Hermann and Tournaux describe certain degenerative changes in the senile uterine tissue which would favor bleeding. The muscular substance is flabby, the vessels of the mucosa are dilated and brittle, and the arteries undergo atheromatous changes. The glands disappear, being replaced by fibrous tissue rich in bloodvessels. The treatment consists in applications of liquor ferri or glycerin and carbolic acid, or in curettage.

The writer reports the case of a patient, seventy-six years of age, whose uterus was quite normal. Hot douches and ergotin failed to control the metrorrhagia, which was finally checked by intra-uterine galvanization.

### Glycerin-injections in the Treatment of Uterine Fibroids.

Chéron (*Ibid.*) speaks highly of intra-uterine injections of sterilized glycerin in cases of fibromyoma. A little over a drachm is slowly injected every two or three days, the vagina being subsequently tamponed with cotton or gauze saturated with boroglyceride.

The effect of the drug is to cause dryness and atrophy of the endometrium, and hence diminution of the tumor. A marked decrease in the flow is observed at the following menstrual period. The writer affirms that the ease and safety of this method of treatment should recommend it in cases in which operative interference is inadvisable, or is refused.

### Ventrofixation in Anteflexion.

Condamin (*Arch. prov. de Chir.; Centralblatt für Gynäkologie*, 1896, No. 35) calls attention to the two forms of pathological anteflexion, the congenital and acquired, the latter being usually due to posterior parametritis of puerperal origin. In both forms the symptoms (sterility, dysmenorrhœa, etc.) are similar, though in the latter vesical and reflex disturbances are more frequent.

He has never seen any permanent benefit follow the ordinary treatment by surgical and mechanical means, and recommends ventrofixation as the best method of permanently straightening the flexion. Some of his cases were complicated by disease of the adnexa. In the latter the results were less satisfactory, but in simple cases the dysmenorrhœa and vesical irritation were entirely relieved.

[It would seem more rational, if such heroic treatment is to be adopted for the relief of a minor ailment, to supplement the ventrofixation by previous tenotomy of the shortened uterosacral ligaments.—H. C. C.]

### The Diagnosis of Small Ovarian Tumors.

Davenport (*Boston Medical and Surgical Journal*, 1896, No. 15) concludes an article on this subject with the following propositions: 1. Small intra-pelvic growths give rise to marked symptoms. 2. Pain is usually noted, but does not bear a constant relation to the location or kind of tumor. 3. Menorrhagia or metrorrhagia is frequently present, especially in cases of cystic ovaries adherent to the uterus. 4. When uterine hemorrhage exists in connection with an intra-pelvic tumor, and is not affected by intra-uterine treatment (curettage or electricity), the tumor is probably ovarian rather than uterine. Reflex symptoms are rare with small tumors, at least in the earlier stage of their development.

### Curettage of the Bladder in Cystitis.

Camero (*Gaz. heb. de méd. et de chirurgie,* September 24, 1896) reports twenty-nine cases of painful cystitis treated according to Guyon's method, with nineteen cures and ten failures. The technique is as follows: the patient having been anæsthetized, the bladder is first irrigated with boric-acid and sublimate solution (1 to 10,000), then a medium-sized Volkmann's spoon is introduced, while the left index-finger is placed against the vesico-vaginal septum as a guide. The instrument is moved carefully over the vesical mucosa in the region of the trigone and neck, where the disease is usually located. The lateral walls are then scraped, always under the guidance of the finger within the vagina, the curette being occasionally withdrawn and the bladder again irrigated. After completely emptying the organ its anterior wall is scraped by lowering the handle of the curette, while the left hand, placed above the pubes, supports the bladder. Finally the urethral mucosa is curetted, and, after renewed irrigation, a self-retaining catheter is introduced and is left *in situ* for from fifteen to twenty days.

No accident has followed these manipulations, which must of necessity be performed with great delicacy in order to avoid perforation of the bladder. Hemorrhage is slight and ceases spontaneously; nor is the pain severe, provided that the catheter is kept free from clots.

The conclusions are: painful cystitis is particularly common in women, and often fails to yield to general and local medicinal treatment. Cystotomy should be reserved for the most serious cases. Curettage of the bladder *per urethram* often effects a cure, alone or followed by local applications, and is a simple operation requiring no special armamentarium.

## Observations on Intraligamentous Ovarian Cysts.

Brigidi (*Ann. d'Ostet. e Ginec.*, 1896, No. 3) concludes a clinical report on this subject as follows: women with intraligamentous cysts are apt to be sterile, because of the frequency with which both ovaries are found in an abnormal position. Under these circumstances both cysts may be of considerable size, or one may be small. Occasionally the opposite ovary is either absent or rudimentary. If the woman has borne children, pregnancy must have occurred before the ectopic ovary became cystic. When there exist supernumerary ovaries, or aberrant portions of ovarian tissue between the broad ligaments, an intraligamentous cyst and one occupying the ordinary position may be found on the same side.

## Psychoses following Operations.

Jacobs (*La Policlinique*, 1896, No. 4) believes that mental derangements which appear immediately after operation permit a more favorable prognosis than those which develop after a considerable lapse of time. He cites several illustrative cases, viz.:

Case I.—Acute mania appearing three days after curettage and perineorrhaphy. It disappeared slowly but completely.

Case II.—Melancholia in a woman, aged thirty-four years, developing six months after vaginal hysterectomy; death occurred four months later.

Case III.—Erotic mania of a violent type; it appeared the day following vaginal hysterectomy, persisted eight days, and then entirely disappeared.

Case IV.—Mania began on the second day after vaginal castration, and terminated fatally.

Case V.—Melancholia developed three weeks after curettage, with insomnia, aphasia, paresis, and death.

## Ovarian Tissue in the Treatment of Climacteric Disturbances.

Mond (*Münchener med. Wochenschrift*, 1896, No. 36) reports a number of cases of reflex nervous disturbances following the natural and artificial menopause, in which ovarian tissue was administered with benefit. Ten tablets (each containing a grain and a half of dried ovarian tissue) were given daily. After the second or third day it was noted that the attacks of flushing, perspiration, and mental depression were less marked. After ten or twelve days, or when about one hundred tablets (corresponding to one hundred and eighty grains of ovarian tissue) had been administered, the nervous disturbances were reduced to the minimum. Patients at the normal climacteric responded most promptly to treatment, their symptoms being decidedly relieved as early as the sixth day.

The writer admits that a permanent cure cannot be expected in case the reflex phenomena are dependent upon atrophy or removal of the ovaries, but their severity may be mitigated and the period of disturbance shortened. Large doses should be given for the first two weeks, and then smaller doses continued for a considerable period, to be increased if the climacteric troubles reappear.

In conclusion, he emphasizes the importance of preserving a portion of ovarian tissue whenever this is possible in operations upon the adnexa, in order to preserve the function of menstruation. This applies, however, to cases in which the uterus is preserved, since Glaevecke observed, in fourteen cases in which the tubes and ovaries were spared when the uterus was removed, the same disturbances as after castration. The ovaries in these cases usually become atrophied in consequence of their diminished vascular supply.

# PÆDIATRICS.

UNDER THE CHARGE OF

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## FORMIC ALDEHYD IN THE TREATMENT OF RINGWORM OF THE SCALP.

ALFRED SALTER (*British Medical Journal*, September 12, 1896, p. 650) suggests the employment of this remedy as a topical application in the treatment of ringworm of the scalp. Experimentally, he has found that pure cultures of both trichophyton megalosporon and microsporon are effectually killed by a short exposure merely to the vapor; twenty minutes usually sufficed to destroy the microsporon, though a rather longer time was necessary for the megalosporon, the difference depending upon the fact that the former species does not spore upon artificial media. The envelopment of the fungus by either sebum or keratin offers no pronounced obstacle to the permeation of the infiltrated hair by this drug.

Forty cases of ringworm were treated, the majority with Schering's formalin in full 40 per cent. strength, though in the later cases formaldehyd of English manufacture was used. The fluid was vigorously rubbed in with a large brush or mop for ten minutes, the hair having been shaved round the margin of the patches. This application was repeated every other day on four occasions, and then entirely discontinued. In some patients the head was painted every day for four successive days. Of the forty cases only five required repainting from non-eradication of the disease, and in these the fault lay not with the remedy, but in the fact that owing to the struggles of the child no proper application could be made. The ages of the children treated varied from four to twelve years, and the extent of the disease varied from a small, strictly localized patch to areas which were practically coextensive with the whole scalp. Microscopical examination was always made before treatment was begun in order to verify the diagnosis, and after treatment before pronouncing a case cured.

Formalin thus applied induces discomfort and irritation of very brief duration, rather than actual pain, and does not vesicate the scalp as it does the skin elsewhere. Only three cases showed any suppuration after its use, and in these the process was slight and did not destroy any of the follicles. It produces, however a thick crust, just as weaker solutions cause desquamation, upon the skin of the arm, and the subsequent application of some emollient is advisable to accelerate the removal of this exudation. Growth of healthy hair commences immediately, and in three or four weeks the denuded patch is covered with hairs one-sixth of an inch long.

A curious complication in six of the cases. in which the area treated was very large, was œdema of the face, appearing some hours after the application. The skin, however, was not hot or red, and there was no pain or constitutional disturbance.

## Phenocoll Hydrochlorate in Pertussis.

Vargas (*Therapeutische Wochenschrift*, January 5, 1896) states that, among all the drugs he has used in the treatment of whooping-cough, none has succeeded so well in lessening the intensity and frequency of the paroxysms and in preventing complications as has phenocoll hydrochlorate. He reports forty-two cases successfully treated. The dose varied from 0.07 grm. to 2 grm. daily, given in mucilage or in water, in which it is soluble in the proportion of 1 to 7. Its action seems to be not as a germicide, but as a direct sedative to the convulsive cough. During the first two weeks this effect is only temporary, for the paroxysms gradually return when the remedy is suspended. In all of the forty-two cases treated the good effects were noticeable within twelve hours ; but in some cases the number of paroxysms was not reduced until the following day. Even in very young children, and in complicated cases, this remedy produced neither nausea, vomiting, collapse, nor other disagreeable consequence. It is very quickly excreted, elimination beginning twenty minutes after ingestion and being completed in from fifteen to twenty hours.

## Tuberculosis in Early Infancy.

Kossel (*Der Kinderarzt*, 1896, vii. S. 19) has observed twenty-two children, varying in age from two months to three years, during the course of their illness with tuberculosis. In fourteen children dying from other causes, at ages from one and one-half to ten years, tuberculous foci were found in the bronchial glands of ten and in the mesenteric glands of one, none of which had manifested symptoms during life. In the series of twenty-two cases, in which the disease was recognized during life, changes in the respiratory tract and its lymphatics were most frequent, while those of the digestive tract were next in frequency ; in the latter cases the disease was primary.

The observations made in numerous cases of extensive tuberculous disease in young infants has suggested the possibility of infection during intra-uterine life. As militating against this view, the author states that he has never found older tuberculous foci in the liver, into which practically all germs must be carried by the umbilical vein before reaching the general fœtal circulation. It is noteworthy that such lesions were always found either in the lungs or in glandular tissue in close proximity to the exterior of the organism—in bronchial or mesenteric glands. He therefore concludes that for the tuberculosis of early infancy we must admit post-natal infection from without. It is quite obvious that infants subjected to a close contact with parents or relatives who expectorate large quantities of bacilli-laden sputum must take into either the lungs or digestive tract a certain number of these disease-germs. In the course of the study it was discovered that among the children from one to ten years of age sent to the hospital (usually for diphtheria) fully 40 per cent. were suffering from latent tuberculosis.

## A TETANOID STATE OF INFECTIOUS ORIGIN IN THE NEWBORN.

GUIDA (*La Pediatria*, January, 1896, p. 26) states that, apart from true tetanus following umbilical infection, he has observed in newborn infants certain tetanoid phenomena likewise due to infection of the umbilical wound, but so little marked as to pass easily unperceived, at least at the beginning, unless the existence of this morbid state be borne in mind. In the first three or four days these early symptoms appear: At certain times the child does not take the breast, or, having taken it, does not suck and remains completely motionless. On examining carefully and repeatedly it is observed that sometimes the child becomes suddenly cyanosed, then flushed, and finally very pale; the respiration is arrested or is very superficial, the pulse is filiform, the limbs are cold; a little foam appears on the lips. the jaws are fixed, the whole body rigid, and at times some muscular contractions, but no true convulsions. This state, which is not without analogy to eclampsia, lasts for from five to fifteen minutes, then subsides; several recurrences of this sort may take place during the day.

In the three cases that he has observed Guida obtained a rapid cure by means of a careful disinfection of the umbilical wound and by aromatic baths at 95° F. to lessen muscular rigidity and favor the elimination of toxic products. In one case profound prostration followed the more active manifestations of the disease, but was readily combated by small doses of brandy given in a teaspoonful of the mother's milk.

## HÆMATORACHIS AND HÆMATOMYELIA IN A CASE OF PURPURA.

STEFFEN (*Jahrbuch f. Kinderheilkunde*, 1896, Bd. xlii. S. 288) reports under this title an interesting case in a child of five years, who, in the course of a purpura complicated by hemorrhages from the nose, conjunctivæ, and kidneys, became suddenly comatose after presenting the symptoms of paraplegia with paralysis of rectum and bladder and of the left arm and of the area supplied by the left facial nerve. At the end of fifteen days stupor had disappeared, but the paraplegia and the paralysis of the facial and of the sphincters remained. Seven weeks later the child was admitted to the hospital. Examination showed, beside the paralyses noted above. complete anæsthesia reaching to the level of the umbilicus and a bedsore about the anus. At the end of four months two eschars had formed over the sacrum, and the child finally died.

At the autopsy a blood-cyst, the size of a nut, was found in the right corpus striatum and extending into the optic thalamus. In the vertebral canal between the tenth and eleventh dorsal vertebræ the dura, pia, and cord were found matted together, the cord being strongly compressed. Macroscopically there was distinct degeneration of the columns of Goll and of the left lateral column, especially marked in the lower part of the dorsal cord and in the whole lumbar portion. This appearance was confirmed in the microscopic sections, numerous masses of hematoidin-crystals and granular material being noticeable throughout both these divisions of the cord. These foci were especially numerous upon the posterior face of the cord, advancing toward the centre and in places reaching to the anterior surface. This condition was evidently due to sanguineous effusion within and without the cord. The permanent paraplegic symptoms were attributed to compression of the cord against the tenth and eleventh dorsal vertebræ.

## PATHOLOGY AND BACTERIOLOGY.

UNDER THE CHARGE OF

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### COMPLICATIONS OF GONORRHŒA.

With the accumulation of cases of gonorrhœa carefully studied from the bacteriological standpoint the close etiological relationship between the primary disease and its numerous complications becomes daily more apparent. While the evidence in but few of the reported cases is wholly above criticism, there is very much to favor the view that the various associated joint-affections; the suppurative processes, not only of the deeper portions of the genito-urinary tract, but of remote organs of the body; the occasional cases of acute complicating endocarditis and of pyæmia, are all intimately related etiologically to the original urethritis. But from this it must not be understood that the cause of these affections has in all cases been found to be the gonococcus of Neisser. Bacterial examinations have demonstrated the very frequent—indeed, almost constant—presence of the gonorrhœal discharges of other bacteria than the gonococcus, and analysis of the associated bacteria of this "mixed infection" has made it clear that several of the varieties more commonly present are possessed of decided pyogenic qualities. If, then, the complicating disturbances are in reality dependent upon the primary disease for their causation and are not mere coincidental affections, four possibilities of their etiology must be admitted. They may be due to: (1) the gonococcus alone; (2) to one or other of the associated bacteria alone; (3) to the combined effects of the gonococcus and the associated germs; or (4) to the effects upon the tissues of toxic principles absorbed from the urethral disease without secondary bacterial infection at all; and, in fact, the cases which have been carefully studied from the bacteriological standpoint may be readily classified as belonging to one or other of the first three of these classes.

But few, however, of the cases in which the complication has been thought to be due to the gonococcus have been so carefully investigated as to challenge criticism in all particulars. This has been due in large measure to the difficulties attending the unmistakable identification of the gonococcus, owing to the fact that until comparatively recently it has baffled all efforts to cultivate it on artificial media. In 1892 Wertheim succeeded in growing it upon nutrient agar to which one-half its volume of blood-serum had been added, and since that time numerous other observers have confirmed this result. But, since a complicated medium of this kind is rarely accessible to the clinician, and is often not obtainable even by the pathologist at the moment of making an autopsy, comparatively few attempts to isolate the gonococcus by cultures from the lesions in suspected cases have been made, and its identification has been based to a great extent upon its morphological and staining peculiarities. Thus, all rather large diplococci, having flattened adjacent sides, occurring in the pus-cells, decolorizing very readily by alcohol when previously stained by the anilin-dyes, remaining unstained when Gram's method was employed, and failing to grow on the ordinary culture-media, have been regarded as true gonococci, Neisser having shown these peculiarities to be possessed by that germ, and the complications of gonorrhœa in which germs conforming to these tests have been found have been unreservedly ascribed to the effects of the gonococcus.

In view of these facts, two cases which have recently been reported are of unusual interest as showing the impossibility of positive identification of the gonococcus without the aid of cultures.

The first of these cases, reported by DAUBER and BORST in the *Deutsches Archiv für klinische Medicin*, 1895, lvi. 231, occurred in a young man aged twenty years, whose gonorrhœa had been in progress ten days before his admission to the hospital. There was then an abundant discharge in which the microscope showed numerous diplococci similar in shape and size to the gonococcus, abundant in the pus-cells, and decolorized by Gram's method. During the first ten days in hospital the progress of the case was uneventful. except for the development of a small abscess in the glans penis, which communicated with the urethra by a small fistulous opening. The pus of this abscess was found to contain the same germs as the urethral discharge. On the tenth day, however, the patient had a distinct chill and fever set in, at first irregular, but after the first two days of a remittent continuous type. This febrile condition, for which no definite cause could be discovered, continued for a month, when, after a chill, the temperature rose quickly to 40.3° C. (104.5° F.), and it soon became evident from the presence of an aortic regurgitant murmur that endocarditis had developed. This ended fatally in a little more than three weeks.

Up to two weeks before the patient's death "gonococci" were regularly found in the urethral discharge, but toward the last in constantly decreasing numbers. Associated with these gonococci were other bacteria, some, diplococci, closely resembling the gonococcus, but differing from it in staining by Gram's method.

During the course of the endocarditis the supposition was that the complication had resulted from a general infection by the gonococcus, and in the hope of proving this repeated efforts were made to detect the gonococcus in the blood of the finger-tips, but without success. All the plates except one made from this blood were sterile—the growth on the one plate seemed to be the result of contamination.

At the autopsy, five hours after death, cultures were made from the blood and from the spleen-pulp, both in the ordinary culture-media and in those especially adapted to the growth of the gonococcus. Examination was also made of the bacteria very abundantly present in the extensive ulcerations of the aortic valves. In their morphology and staining-reactions they were identical with the gonococcus of Neisser, but in cultures they were found to be quite different, and it was therefore evident that in this case the endocarditis had not been caused by the gonococcus, although the bacteria which did cause it may have found their entrance to the body from the urethra. Accordingly, while not denying the possibility of the gonococcus causing the complications of gonorrhœa, Dauber and Borst contend that as yet convincing proof is lacking, since cultures are the only reliable means of differentiation of the gonococcus from several species of bacteria closely resembling it.

The same fact is even more strikingly brought out by KIEFER in an article in the *Berliner klinische Wochenschrift*, 1896, No. 28, 628, in which the results of a careful comparative study of the germs found in a case of acute cerebrospinal meningitis complicating gonorrhœa are recounted. No details of the clinical history are given. Morphological examinations of the pus from the urethra and of that from the inflamed meninges showed both to contain large diplococci clustered in the pus-cells, and having all the structural and staining characteristics of the gonococcus. Cultures, however, showed the germs to be distinctly different, that in the urethra being in fact the gonococcus, while that in the meninges was found to be the meningococcus intracellularis of Weichselbaum.

Careful bacteriological study of these germs demonstrated the impossibility of differentiating them without the aid of cultures, but that by this means they are easily distinguishable. On media adapted to the growth of the gonococcus the meningococcus-growth is more rapid and abundant than that of the gonococcus, and the colonies show a much greater tendency to overgrow the entire plate. But the most certain means of differentiation of the two germs is in the use of glycerin-agar as a culture-medium. On this the gonococcus fails wholly to develop, while the growth of the meningococcus is abundant and rapid.

Animal-inoculations with the meningococcus resulted negatively; but, on the other hand, the susceptibility of man to its effects was strikingly shown by the occurrence of an accidental inoculation in the laboratory, as the result of which Kiefer became affected with an acute purulent rhinitis, in the pus from which the meningococcus was found to be present in large numbers. This direct proof of the pathogenic quality of the meningococcus is of great interest, and, as Kiefer suggests, it is quite likely that not a few of the suppurative inflammatory conditions (of the nose, ear, mouth, etc., for example) which have occurred in association with gonorrhœa and which, because of the morphological identity of the germs found in them with the gonococcus, have been attributed to the gonococcus, have in reality been the result of infection with the meningococcus. And, in conclusion, Kiefer insists that without resort to cultures this germ cannot with certainty be differentiated from the gonococcus.

In view of the doubt which these investigations throw upon all those cases of gonorrhœal complications attributed to the gonococcus because of the presence of germs in the lesions morphologically indistinguishable from the gonococcus, two recently reported cases in which the proof was made clear by means of cultures are of much interest, proving beyond peradventure the etiological relationship of the gonococcus to the complication.

In the first of these cases the complicating inflammation affected both knee-joints. The case is reported by COLOMBINI in the *Monatshefte für praktische Dermatologie*, xxi. No. 11. An ordinary gonorrhœa, the second attack from which the patient had suffered, was complicated three weeks after its onset by acute inflammation of both knee-joints, followed five days later by a general roseola-like eruption. With the onset of these complications fever and prostration developed and the spleen became enlarged, suggesting to Columbini that general infection from the urethra had occurred. Repeated examinations of the blood failed to disclose the cause of this infection, which was, however, shown to be the gonococcus by a careful examination of the pus drawn from the inflamed knee. This gave the gonococcus in pure culture on Wertheim's medium, which, after cultivation through several generations, was shown to be pathogenic by inoculations into the urethra of two healthy men.

Columbini attributes the exanthem in this case also to the gonococcus, and suggests that not a few of the so-called "drug-eruptions" of gonorrhœa may be in reality the result of dissemination of the gonococcus throughout the system. After the disappearance of the eruption large doses of Peru and cubeb balsams were administered to ascertain whether they would cause a reappearance of the eruption, but no such result was observed.

A similar case is reported by THAYER and BLUMER (*Archives de médecine expérimentale et d'anatomie pathologique*, 1895, vii. 701), in which the complications were ulcerative endocarditis and general septicæmic infection. The case was that of a woman, thirty-four years of age, who came to the Johns Hopkins Hospital in April, 1895, complaining of rheumatic pains from which she had suffered for three months. Examination of the heart disclosed both presystolic and systolic murmurs, and a gradually extending area of cardiac dulness, fixing the diagnosis of endocarditis. The spleen was much enlarged, and examination of the blood showed pronounced leucocytosis. Low fever was also noted. Diarrhœa and gradually increasing weakness resulted in death about three weeks after admission to the hospital.

In the search for a source of infection during life gonococci were detected in the blood of the median basilic vein, and were cultivated from it in a mixture of blood and agar in the proportion of 1 to 3. The morphology and mode of growth of these germs were identical with the similar characters of the gonococcus, and their failure to grow on the ordinary culture-media afforded additional evidence of their identity. These culture-experiments were repeated five days after the first success, with a like result, and subsequent examination of mucopus from the vagina and from the cavity of the uterus disclosed the presence of the same germs. The cultures made at the time of the autopsy were not so fortunate, partly owing to the scarcity of media at the laboratory upon which the gonococcus would grow, but it is reported that all the ordinary culture-media inoculated remained sterile; but microscopic examinations of the ulcerated heart-valves showed in them large numbers of diplococci morphologically identical with the gonococcus, decolorizing when stained by Gram's method. A mouse inoculated with a portion of thrombus obtained from one of the endocardial ulcers remained healthy.

It appears, then, from the cases which we have noticed that the identification of the gonococcus cannot be beyond question without confirmatory cultivation on appropriate media, and that doubt must rest on all those cases of gonorrhœal complications attributed to the gonococcus on purely morphological grounds. We have, however, in the studies of Columbiui and of Thayer and Blumer proof that the gonococcus is in fact at times the cause of the complicating lesions, and suggestions as to the way in which it should be sought.

## Arthritis Complicating Pneumonia.

In connection with the report of two cases of acute lobar pneumonia in which arthritis occurred as a complication VOGELIUS presents an interesting table of the similar cases heretofore described in which bacteriological examination of the arthritic exudate was made. These number in all eleven cases, in all of which the pneumococcus was found as the cause of the complication. In the majority of the cases the complication became apparent within five days after the onset of the pneumonia; in one case not until the eleventh day. In six cases the exudate is described as purulent, in two as seropurulent, in one as serofibrinous, and in two its character is not mentioned. In four of the cases considerable destruction of the joint occurred, either as the result of periarthritis or of ulceration of the articular cartilages and denudation of the bone.—*Archives de méd. expér. et d'anat. path.*, 1896, viii. No. 2, 186.

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